



ENVIRONMENT CANTERBURY

NEW ZEALAND RURAL WASTE MINIMISATION PROJECT:

MILESTONE 4 PHASE II:

DETAILED BUSINESS CASES

TRUE NORTH CONSULTING
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1. EXECUTIVE SUMMARY

The New Zealand Rural Waste Minimisation Project (the Project) is being undertaken to better understand the nature of waste on farms and to begin to identify alternatives to burning, burial and bulk storage of waste. The Project has the following objectives:

1. To determine the impacts on and risks to New Zealand's natural resources (land, water and air), economy, and social and cultural wellbeing from current rural waste burning, burying and stockpiling practices.
2. To identify new waste minimisation options for rural waste management and assess the technical and economic feasibility of these.
3. To develop implementation plans with service providers for feasible waste minimisation options.

The focus of the work undertaken in this report has been on the second objective: identifying and assessing the economic and technical feasibility of new waste minimisation options. Following the initial work undertaken in Milestones 2 and 3, the work undertaken in Milestone 4 has been focused on building detailed business cases for feasible options.

At the conclusion of Milestone 3, a list of eight options was produced and evaluated in terms of feasibility as follows:

Option	Milestone 2 Feasibility Assessment	Assessments undertaken in Milestone 3				Revised Feasibility Assessment
		Supply Chain Assessment	Life-cycle Assessment	Financial and Operational Assessment	Risk Assessment	
EnviroWaste Plastics Collection and Recycling	VERY HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH
Agrecovery Expanded Waste Stream Collection	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Plasback Plastics Collection	HIGH	MODERATE	HIGH	MODERATE	HIGH	MODERATE
Community Organisation On-Farm Collection	MODERATE	LOW	HIGH	LOW	HIGH	LOW
Expanded Territorial Authority Recycling Drop-Off Hubs	MODERATE	LOW	HIGH	MODERATE	MODERATE	MODERATE
Expanded ROSE Oil Recycling Scheme Drop-Off Hubs	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH

Option	Milestone 2 Feasibility Assessment	Assessments undertaken in Milestone 3				Revised Feasibility Assessment
		Supply Chain Assessment	Life-cycle Assessment	Financial and Operational Assessment	Risk Assessment	
Fonterra Sharps Collection	HIGH	HIGH	HIGH	HIGH	LOW	HIGH
Temporary Pop-up Recovery Events	N/A	MODERATE	HIGH	HIGH	MODERATE	MODERATE

A key development during Milestone 4 was the appointment of EnviroWaste as the service delivery contractor for Agrecovery's drum and container programme. As a nationwide company with extensive waste handling and processing capabilities, the full engagement of EnviroWaste into the rural waste space has presented a range of new opportunities to coordinate and unite options with a view towards providing farmers with a low cost 'one-stop-shop' for rural waste services.

The appointment of EnviroWaste as a key Agrecovery contractor has prompted the merging of the 'EnviroWaste Plastics Collection and Recycling' option and the 'Agrecovery Expanded Waste Stream Collection' option to give a new option: 'Agrecovery / EnviroWaste Rural Waste Services'. The services being contemplated under this new option also make it apparent that this option encompasses the 'Expanded Territorial Authority Recycling Drop-Off Hubs' option and the 'Temporary Pop-up Recovery Events' option which have also been merged into the option above.

This merging of options presents the risk that EnviroWaste as a service delivery organisation may have an undesirable level of control of the rural waste service market, with the potential to create a monopoly and reduce market efficiency and competition.

Yet, it is likely that this service delivery will ultimately fall under the oversight of the non-profit Agrecovery Foundation, which has a board representing different aspects of the agricultural and horticultural sectors. This board can provide a safeguard against such issues, in that it has the power to withdraw service delivery contracts from EnviroWaste and appoint them to another provider should service efficiencies decline.

With this options merger, the options under consideration under the Project reduce to five, which have been assessed as follows:

Option	Milestone 3 Feasibility Assessment	Assessments undertaken in Milestone 4				Final Feasibility Assessment
		Business Model Assessment	Supply Chain Assessment	Financial Model Assessment	Risk Assessment	
Agrecovery / EnviroWaste Rural Waste Services	MODERATE - HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Plasback Plastics Collection	MODERATE	LOW	MODERATE	LOW	HIGH	LOW

Option	Milestone 3 Feasibility Assessment	Assessments undertaken in Milestone 4				Final Feasibility Assessment
		Business Model Assessment	Supply Chain Assessment	Financial Model Assessment	Risk Assessment	
Community Organisation On-Farm Collection	LOW	MODERATE	MODERATE	MODERATE	HIGH	MODERATE
Expanded ROSE Oil Recycling Scheme Drop-Off Hubs	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Fonterra Sharps Collection	HIGH	HIGH	HIGH	HIGH	LOW	HIGH

Of these five options, business cases for implementation have been provided for all but Plasback Plastics Collection, which is not considered a preferred option under this project going forward.

In advancing this project towards options implementation, the following are intended as the focal elements for planning and pilot trials:

- Agrecovery / EnviroWaste Rural Waste Services: Plan, promote and execute a small number of pilot Temporary Pop-up Recovery Events including new waste streams and regional coordination with on-farm collections. Look also at providing soft plastics collection services at Territorial Authority Recycling Drop-Off Hubs and other Agrecovery container collection sites.
- Community Organisation On-Farm Collection: Work closely with specific community organisations to support planning for implementation of on-farm collection services and, where feasible, assist with localised service pilots.
- Expanded ROSE Oil Recycling Scheme Drop-Off Hubs: Plan, promote and execute service provision at two Farmlands stores.
- Fonterra Sharps Collection: Trial collection of sharps containers via a Temporary Pop-up Recovery event and support with planning for wider option rollout.

2. INTRODUCTION

2.1. PROJECT OVERVIEW AND OBJECTIVES

In 2013 Environment Canterbury commissioned a study which sought to understand the non-natural waste streams and volumes of waste being generated on farms in the Canterbury region. This work found that, on average, farms were producing nearly 10 tonnes of non-natural rural waste each year in addition to domestic waste and animal remains. The report also confirmed that burning, burial and bulk storage of waste on farms are the prevalent methods being deployed to manage waste. Investigative work undertaken in the Waikato and Bay of Plenty regions in 2014 yielded similar results.

Based on the concerns this work raised, Environment Canterbury sought and received funding from the Ministry for the Environment's (MfE) Waste Minimisation Fund (WMF) to undertake a project to better understand the nature of waste on farms and to begin to identify alternatives to burning, burial and bulk storage of waste. This project is called the *New Zealand Rural Waste Minimisation Project* (the Project).

In addition to funding from the Waste Minimisation Fund for the Project, Environment Canterbury has part-funded the work and additional funding has been received from:

- Waikato Regional Council
- Bay of Plenty Regional Council
- Canterbury Waste Joint Committee
- WasteMINZ Strategic Investment Fund
- Synlait Milk
- Agrecovery Foundation
- 3R Group Limited

The project is overseen by a Governance Group that is chaired by Environment Canterbury and includes representatives from:

- Waikato Regional Council (as a regional council representative)
- Ashburton District Council (as a local council representative)
- Synlait Milk
- WasteMINZ
- Fonterra
- DairyNZ

The Project has the following objectives:

1. To determine the impacts on and risks to New Zealand's natural resources (land, water and air), economy, and social and cultural wellbeing from current rural waste burning, burying and stockpiling practices.
2. To identify new waste minimisation options for rural waste management and assess the technical and economic feasibility of these.
3. To develop implementation plans with service providers for feasible waste minimisation options.

The Project comprises six milestones across three project phases, as follows:

Phase	Milestone	Description	Status
1	1 - Risk assessment	<ul style="list-style-type: none"> Undertake risk assessment of rural waste disposed on-farm and prioritise high risk waste streams for further work. 	Complete
<i>Project stage-gate: MfE and ECAN agreement required to proceed past this point.</i>			
2	2 - Situational analysis and options for minimising rural waste	<ul style="list-style-type: none"> National and international review of options for increasing rural waste reduction, reuse, recycling, recovery and disposal, and a preliminary feasibility assessment of each. 	Complete
2	3 - Explore potential waste minimisation options	<ul style="list-style-type: none"> Informed by the strategy developed in Milestone 2, explore options for rural waste minimisation identified as feasible in Milestone 2 in more detail including financial implications, potential risks and barriers, and benefits. 	Complete
2	4 - Detailed business cases	<ul style="list-style-type: none"> Prepare complete and detailed business cases for each preferred option. 	This report
<i>Project stage-gate: MfE and ECAN agreement required to proceed past this point.</i>			
3	5 - Implementation of preferred options & communications strategy	<ul style="list-style-type: none"> Select and refine preferred options for implementation and create implementation plans. Develop communications strategy and work plan to promote improved rural waste management and minimisation. Develop work plan, identifying selected mechanisms and tools that will be used. 	Due 9/6/2017 (To Be Confirmed)
3	6 - Option pilot trials & communications roll-out	<ul style="list-style-type: none"> Undertake preferred option pilot trials and prepare a final report detailing pilot processes and outcomes. Implement communications strategy and work plan. Publish and distribute materials and tools. 	Due 10/11/2017 (To Be Confirmed)

This report represents the deliverable for Phase 2, Milestone 4: *Detailed Business Cases*. This milestone aims to prepare business cases and final technical and economic feasibility assessments on options for rural waste minimisation previously identified as feasible. This milestone has the following objectives:

- Prepare complete and detailed business cases for each preferred option.
- Develop detailed business cases, supply chain models and financial models.
- Undertake final technical and economic feasibility assessments.
- Address the Rural Waste Focus Group to download findings of Phase 2, test perceptions of preferred options and inform on aims of Phase 3.

2.2. PROJECT SUMMARY - MILESTONES 1 TO 3

Phase 1 of the Project focused on undertaking a risk assessment of rural waste disposed of on-farm and prioritising high risk waste streams for further consideration in subsequent phases of the project. This work was undertaken by SLR Consulting and completed in September 2015.

Based on assessed risks, the analysed non-natural rural waste streams were then ordered in terms of priority as follows (top 30 shown only):

- | | | |
|------------------------|-------------------------------|----------------------------------|
| 1. Paints, solvents | 11. Animal feed bags | 21. Glass |
| 2. Oil containers | 12. Baleage wrap | 22. Greenhouse plastic sheeting |
| 3. Used oil | 13. Mulch film and crop cover | 23. Plastic bags |
| 4. Aerosols | 14. Silage wrap | 24. Household batteries |
| 5. Vehicle batteries | 15. Fertiliser bags | 25. CCA treated timber |
| 6. Waste oil filters | 16. Animal health plastic | 26. PVC |
| 7. Agricultural sprays | 17. Seed bags | 27. Untreated timber offcuts |
| 8. Drench/dip | 18. Plastic (pallet wrap) | 28. Plastic |
| 9. Sharps | 19. Containers | 29. Wood-chip animal bedding |
| 10. Netting | 20. Drums | 30. Metal (roofing, metal, wire) |

This prioritised list of waste was carried forward into Phase 2 of the Project to help focus and guide endeavours to minimise rural waste, although opportunities are sought which address waste streams beyond this list.

The overall focus for Phase 2 of the Project is to identify and/or create sustainable, feasible options that will contribute to greater levels of rural waste minimisation in New Zealand and stand as enduring alternatives to the burning, burial and bulk storage of these wastes. The scope of the project is focused on non-natural rural waste streams.

Consideration of waste streams in Phase 2 is based on wastes being categorised as follows:

- Hazardous wastes (wastes ranked 1 to 4 and 7 to 9 on the priority list)
- Soft plastics (wastes ranked 10 to 18, 22, 23 and 28 on the priority list)
- Hard plastics (wastes ranked 19, 20 and 26 on the priority list)
- Metal (wastes ranked 5,6 and 30 on the priority list)
- Other wastes (wastes 21, 24, 25, 27 and 29 on the priority list)

Based on these waste groupings, Milestone 2 considered a range of waste collection options as follows:

- On-farm collection by councils/territorial authorities
- On-farm collection by waste contractors
- On-farm collection via distributor backhaulage
- On-farm collection via one-off collection rounds
- Drop off collection at council/territorial authority hubs
- Drop off collection at commercial waste hubs
- Drop off collection at one-off collection hubs

- Drop off collection at permanent collection hubs
- Drop off collection at retail stores

The options for waste categories were also considered in terms of how they could be addressed in accordance with the waste hierarchy as follows:

- Reduction of waste
- Re-use of waste
- Recycling of waste
- Energy recovery from waste
- Disposal of waste

In Milestone 3 these options were refined and further evaluated to provide a revised feasibility assessment. In each of the assessments undertaken in Milestone 3, and in the table below, a 'traffic light' system of colour coding of results is used. Green indicates a positive result (high performance or low risk), orange indicates a neutral or acceptable result (moderate performance or moderate risk) and red indicates a negative result (low performance or high risk). This colour coding is carried forward and also used in this report.

Based on the assessments and analysis undertaken the list of options and their updated feasibility was assessed as follows:

Option	Initial Milestone 2 Feasibility Assessment	Assessments undertaken in Milestone 3				Revised Feasibility Assessment
		Supply Chain Assessment	Life-cycle Assessment	Financial and Operational Assessment	Risk Assessment	
EnviroWaste Plastics Collection and Recycling	VERY HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH
Agrecovery Expanded Waste Stream Collection	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Plasback Plastics Collection	HIGH	MODERATE	HIGH	MODERATE	HIGH	MODERATE
Community Organisation On-Farm Collection	MODERATE	LOW	HIGH	LOW	HIGH	LOW
Expanded Territorial Authority Recycling Drop-Off Hubs	MODERATE	LOW	HIGH	MODERATE	MODERATE	MODERATE
Expanded ROSE Oil Recycling Scheme Drop-Off Hubs	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH

Option	Initial Milestone 2 Feasibility Assessment	Assessments undertaken in Milestone 3				Revised Feasibility Assessment
		Supply Chain Assessment	Life-cycle Assessment	Financial and Operational Assessment	Risk Assessment	
Fonterra Sharps Collection	HIGH	HIGH	HIGH	HIGH	LOW	HIGH
Temporary Pop-up Recovery Events	N/A	MODERATE	HIGH	HIGH	MODERATE	MODERATE

At the conclusion of Milestone 2 a range of disparate and largely unconnected options for addressing rural waste were evaluated and presented for further consideration in the Project, as shown above. As further feasibility assessment and stakeholder engagement activity was undertaken in Milestone 3 it became clear that opportunities existed to connect and rationalise a number of the options, and to modify others, so that they sit more comfortably together. This provided an overarching approach focused on maximising farmer participation and acceptance of the options offered as alternatives to burning, burying and bulk storage of rural wastes.

This approach is driven by two key conclusions drawn from the work undertaken in this project to date:

1. *There is a tension between cost and convenience.* As concluded in Milestone 2, the ideal solution to any rural waste issue is one that is low (or no) cost and very convenient to farmers. Economically, this is difficult to achieve. Solutions that are highly convenient (such as on-farm collection) tend to be expensive. Solutions that are low cost (such as territorial authority drop-off points) tend to be time consuming and inconvenient for farmers. Clearly a trade-off needs to be made such that those who value convenience over cost are able to access a service that fits their needs, while those who value economy over convenience are also able to access a service that works.
2. *A 'one-stop-shop' approach is desirable.* Farmers having to separate out different wastes and take separate action for each of them in terms of recycling or disposal is not an ideal approach. Farmers are busy and do not appear to want to deal with a range of disconnected interventions for waste management. A preferred approach is one that can deal with as many priority waste streams at once as possible.

The Rural Waste Management Model (the Model) developed in Milestone 3, and shown in Figure 1 on the following page, enacts these two strategies and rationalises and aligns options based on the following:

- Waste streams are simplified into Hazardous Wastes (such as agrichemicals and sharps), High Volume Recyclables (such as hard and soft plastics) and Low Volume Recyclables (such as vehicle batteries and oil filters).
- These streams are then split in terms of strategic approach between Low Volume Users and High Volume Users.
- The broad strategy pursued in the Model for high volume users is on-farm collection.
- The broad strategy for low volume users in the Model is the provision of a range of drop-off points for waste.

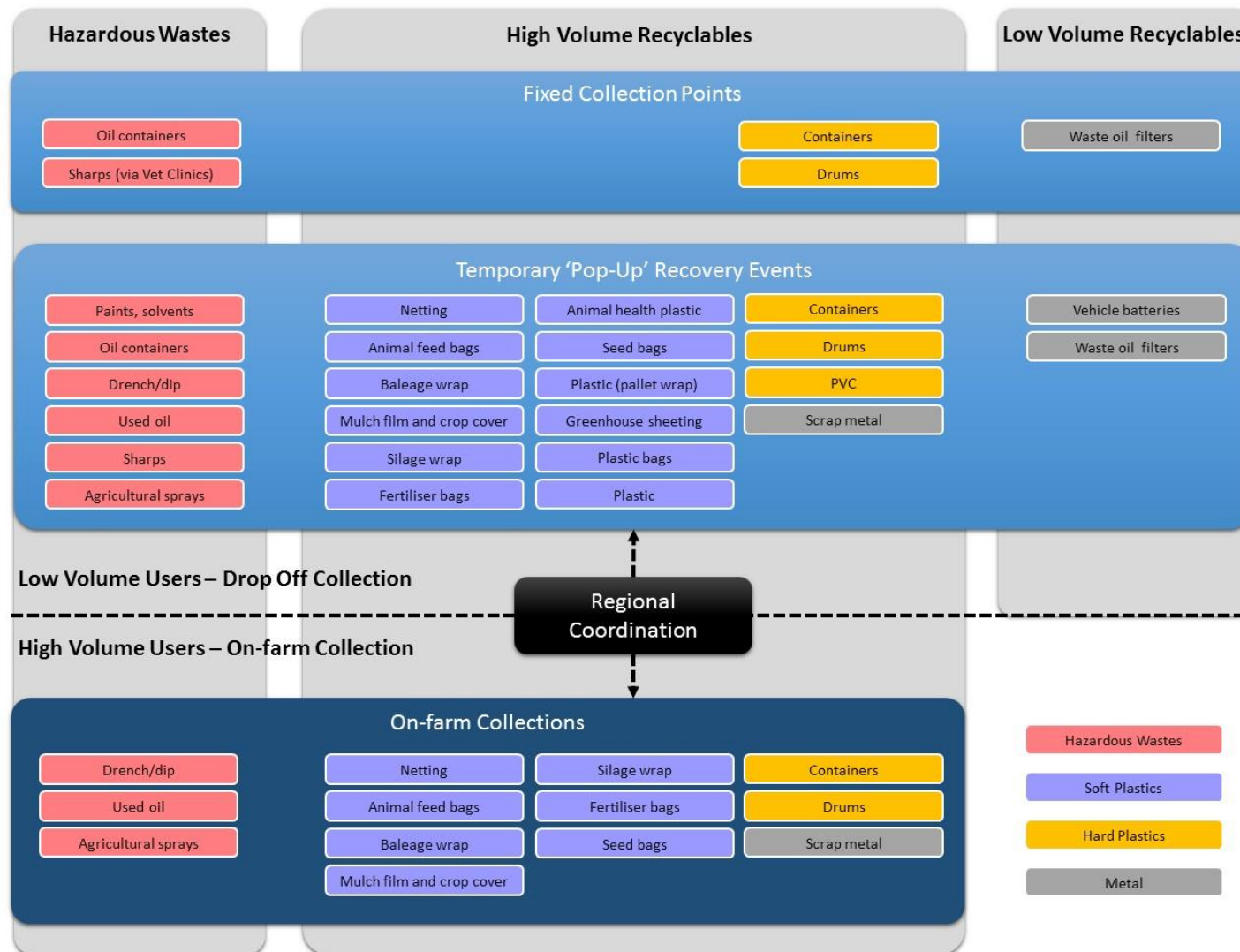


Figure 1: Rural Waste Management Model and priority waste streams

This milestone and report focuses on building detailed business cases around the eight remaining options, including ensuring the partners required for each option are in place and the financial implications of pursuing new options are well understood and accepted by all involved.

3. OPTIONS UPDATE

Following the preliminary and revised feasibility assessments undertaken in Milestones 2 and 3, Milestone 4 has focused on creating detailed business cases for preferred options and making a final determination as to economic and technical feasibility.

The following sections detail additional key information and developments relating to the options, as well as indicating whether each option will continue to be assessed under the Project, or whether it has been dismissed as an option. Where options have been identified as no longer presenting feasibility for the purposes of the Project, the reasons for this are clearly stated.

3.1. ENVIROWASTE PLASTICS COLLECTION AND RECYCLING

Feasibility:	Revised technical and economic feasibility assessed as high.				
Assessments:	Supply chain: Moderate		Life-cycle: High		
	Financial and Operational: High		Risk: Moderate		
Type:	Waste Contractor Collection		Recycling of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

At the conclusion of Milestone 3, this option was considered to offer high feasibility, with some concerns over the delays in the operation of EnviroWaste's plastics recycling plant in Christchurch. This plant is not yet open, but EnviroWaste remains confident that the plant will operate as intended and likely be in operation between March and May of 2017.

While in isolation these delays would cause additional concern, the focus on this particular technology has been somewhat overtaken by other commercial developments at EnviroWaste, and a more detailed understanding of the different options available for plastic recycling.

Foremost among these developments since the conclusion of Milestone 3 has been the successful tender by EnviroWaste for the Agrecovery plastic container and drum collection contract. This contract will involve EnviroWaste undertaking on-farm collections and events for Agrecovery with an initial focus on hard plastics. However, discussions facilitated by this project between Agrecovery and EnviroWaste have identified strong mutual interest in exploring the addition of other waste streams into this relationship, with a particular focus on soft plastics. To this end, considerable joint effort has gone into determining how services could work, with an expressed intention by both parties to pilot services beyond hard plastics.

Therefore, because the activities initially contained within the EnviroWaste Plastics Collection and Recycling option have now become part of the discussions focused on extending Agrecovery's service provision, the options have been merged in this report as a new option: **Agrecovery / EnviroWaste Rural Waste Services**.

A final feasibility assessment and business case for this option are presented later in this report.

3.2. AGRECOVERY EXPANDED WASTE STREAM COLLECTION

Feasibility:	Revised technical and economic feasibility assessed as high.				
Assessments:	Supply chain: High		Life-cycle: High		
	Financial and Operational: High		Risk: Moderate		
Type:	Permanent Collection Hubs & Waste Contractor Collection		Recycling of Waste & Disposal of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

At the conclusion of Milestone 3 the potential for Agrecovery to extend its service offering to embrace new waste streams, with a national focus, was considered to offer a high level of feasibility. A clear openness to such expansion had been communicated, subject to the appointment of a service delivery partner with requisite capability to handle new waste streams and to approval by Agrecovery's board based on a compelling business case and successful service piloting.

Following a public tender process in late 2016, Agrecovery has appointed EnviroWaste as its service delivery contractor for its hard plastics programme (drums and containers) as of 1 July, 2017.

As was noted in Milestone 3, both EnviroWaste and Agrecovery have expressed interest in considering the inclusion of soft plastics into their respective service offerings. EnviroWaste has expressed a desire to capture high volumes of farm plastic to properly utilise its new Christchurch-based plastics plant – and to support a company-wide mandate to pursue resource recovery efforts – and Agrecovery has shown strong interest in addressing persistent rural waste issues beyond its current activities. Both parties have also expressed an openness to consider other waste streams beyond plastics and chemicals, with a recognition that a 'one-stop-shop' offers considerable benefits to farmers.

Considerable discussion and development of potential business models has been undertaken between Agrecovery and EnviroWaste, facilitated by this project during Milestone 4. This development has focused on determining the desirability of extending the waste streams covered under the Agrecovery brand. Such an extension would be realised through a combination of on-farm collections, permanent sites and events. As discussions have progressed, it has become clear that the relationship between Agrecovery and EnviroWaste offers a strong opportunity and momentum on which to develop a very broad option for rural waste that encompasses most, if not all, of the priority waste streams under this project.

To this end, much of the focus in Milestone 4 has been on developing a business case and business model for how additional waste streams could potentially come under the Agrecovery programme. This is discussed in detail in the business case for the new Agrecovery / EnviroWaste Rural Waste Services option.

A final feasibility assessment and business case for this option are presented later in this report.

3.3. PLASBACK PLASTICS COLLECTION

Feasibility:	Revised technical and economic feasibility assessed as moderate.				
Assessments:	Supply chain: Moderate		Life-cycle: High		
	Financial and Operational: Moderate		Risk: High		
Type:	Waste Contractor Collection		Recycling of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

At the conclusion of Milestone 3 the feasibility of Plasback as an ongoing option for addressing rural waste broadly in New Zealand was downgraded from 'High' to 'Moderate'. The primary reason for this was the likelihood of EnviroWaste entering the market as direct competition to Plasback.

During Milestone 4, numerous discussions and meetings have been undertaken with senior executives in Plasback and parent companies Agpac and Tapex. These meetings have focused on the likelihood of Plasback facing competition in the future and what potential responses Plasback could make to this.

The attention of the Plasback leadership team has been drawn to the following observations and market changes made during the Project regarding Plasback's position:

- Plasback does not have a customer service management system to monitor service performance and ensure customers receive a timely service and are communicated with effectively. A specification to create such a system has been prepared under this project for Plasback, but Plasback advises that it does not currently have funding available to enact such a system. The lack of such a system is considered a key vulnerability in Plasback's business model.
- Plasback has a very loyal contractor base that is committed to soft plastic collections. Contractors are understood not to make considerable profits from such service provision, but do so because of their belief in the importance of the service. These contractors are often focused on other aspects of their businesses, which can result in long delivery lead times.
- Collections tend to be reactive – purely based on requests – and currently the lack of a management system means the collection routes are not always optimised nor are customers routinely contacted when a collection is going through their area or when the customer has not requested a collection for some time. There are considerable opportunities for rationalisation in this regard, and for contractors to enjoy cost savings that could potentially be passed on to customers.
- Plasback has held its current pricing structure for some years, but there are suggestions there is upwards pressure on this.
- EnviroWaste has expressed a strong intention to capture large volumes of soft plastics waste. The driver in doing so for EnviroWaste is based around processing revenue and corporate mandate rather than a need to earn substantial margins from collection mechanisms. This, coupled with their extensive national network, potentially allows them to collect soft plastics in a relatively cost-effective manner.

- It is likely Agrecovery will seek to incorporate soft plastics into its programme as the management and marketing front-end to EnviroWaste's collection and processing mechanisms. Agrecovery is extremely well connected and supported by the rural sector and key stakeholders in agricultural and pastoral farming sectors. Agrecovery also has strong management and marketing systems and is well resourced to invest further in this regard so as to achieve high collection rates on the back of its other schemes. Agrecovery has the potential to be a 'one-stop-shop' for rural waste, which is well aligned with the objectives of the Project and the expressed desire of farmers.
- The model being explored by Agrecovery / EnviroWaste is flexible, with multiple channels, well-aligned to farmer needs as determined under the Project, and has the potential to be considerably cheaper than the model currently offered by Plasback.

Various options have been explored with Plasback, with a view to identifying how Plasback might continue to operate effectively should competition arise. Two key options have been discussed at length:

- *Supplying plastic directly to Agrecovery / EnviroWaste:* under this option Plasback would sell the plastic currently collected through its programme to EnviroWaste, rather than this material being sent overseas. This is obviously beneficial to EnviroWaste in that it represents a steady supply of volume. It also potentially offers a preferable pathway for use of the plastic in that it would likely be recycled for use in New Zealand. The challenge under this option is that Plasback would still, in all likelihood, face competition from EnviroWaste if a national service for soft plastics was launched. A service that offered shorter collection turnaround times and a lower collection price is likely to take considerable market share from Plasback and potentially make service delivery for Plasback uneconomic.
- *Full service subcontracting to Agrecovery / EnviroWaste:* under this option Plasback would continue to operate its collection network and receive referrals from Agrecovery / EnviroWaste, likely in certain geographical areas where Plasback is strongest. This would allow the service to persevere and the strong contractor network to be retained, and would mean that, in essence, Plasback would not face competition as it would become a contracted service provider to Agrecovery / EnviroWaste. Unfortunately, this option also presents some challenges. As Agrecovery / EnviroWaste is developing a service model that provides collection services at a considerably lower rate than Plasback – which is already financially constrained – it is difficult to see how this would be economically feasible to Plasback, and it is likely that Plasback's contractors would be uncomfortable with lower revenue from service delivery. This is further complicated by the likelihood of this lower pricing also being paired with more stringent customer service expectations. Plasback is also very unwilling for its brand to be lost in such a process, given the ten-plus years of investment into building it. While understandable, the retention of the Plasback brand in service delivery is likely to be resisted by Agrecovery – which would want to project its own brand into this space – and by other plastics manufacturers that may object to the close association between Plasback and Agpac, a key market player in agricultural plastics manufacture.

Currently these issues, and the potential for any change in strategy, are being considered by the board of Plasback's parent company, and the current plan is simply to continue with business as usual.

Once a determination is made, Plasback will either seek to work cooperatively or subcontract to Agrecovery / EnviroWaste, compete directly with any new service or cease operations. Should a contractual relationship with Agrecovery / EnviroWaste be pursued this would then become an element of the Agrecovery / EnviroWaste Rural Waste Services option.

Should Plasback chose to compete directly, an activity for which there is not currently a strong discernible business case, it is likely Plasback would not seek to alter its service delivery model greatly, and would continue as it currently does, subject to the impacts of any competitive forces. Under this scenario, Plasback would not likely be further considered under this project. This would also be the case should Plasback chose to cease operations.

A final feasibility assessment for this option is presented later in this report.

3.4. COMMUNITY ORGANISATION ON-FARM COLLECTION

Feasibility:	Revised technical and economic feasibility assessed as low.				
Assessments:	Supply chain: Low		Life-cycle: High		
	Financial and Operational: Low		Risk: High		
Type:	Waste Contractor Collection		Recycling/Reuse of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

During Milestone 3 it was concluded that, while on-farm collections by community organisations offered a relatively low level of technical and economic feasibility based largely on the level of financial resourcing available to most of these organisations, they have the potential to fill a very important niche in the on-farm rural waste collections market.

As an exemplar of this model, Wastebusters Canterbury was found to excel in providing:

- Strong and informal customer relationships
- A simple and flexible service model that can grow with the customer
- Responsive service delivery

As more time has been spent with Wastebusters Canterbury it has become clear that their growing service based out of Ashburton is very strong in engaging potential customers, explaining to them the merits of recycling farm waste and ensuring they comply with best practice methods for managing waste on an ongoing basis.

Even with the broad model being pursued by Agrecovery / EnviroWaste, community organisations that replicate what Wastebusters Canterbury has achieved offer the potential to secure a far higher level of commitment and engagement than these bigger organisations are likely to achieve. For EnviroWaste - or any commercial organisation operating at this level - to send what is, in essence, an educator, on to each farm that seeks service delivery would be prohibitively expensive. Yet this is a core element of the engagement strategy at Wastebusters Canterbury, driven by an altruistic vision, rather than a commercial imperative. Yet despite this, Wastebusters reports that its service is moderately profitable, and growing.

Based on the potential of this model, a forum was convened during Milestone 4 to bring together other community organisations to explore the potential to offer on-farm collection service for rural waste, and to learn from Wastebusters Canterbury's experience. This forum was attended by:

- Wanaka Wastebusters
- Seagull Centre Thames
- Waitaki Resource Recovery Trust
- Innovative Waste Kaikoura
- CReW / Pou Whakaaro
- Helensville Community Recycling Centre
- Caroline Jones – Community-based provider from Selwyn District

The event focused on understanding how Wastebusters Canterbury has built its business model and the key learnings from this process. The other attendees also shared their experiences in pursuing waste collection services, and attendees were then invited to give an indication of whether they would intend to pursue services in the same vein as Wastebusters Canterbury.

The responses were as follows:

- Seagull Centre Thames is currently providing some waste collection services and, following the forum, considers it 'somewhat likely' that they would pursue the development of on-farm collection services for rural waste in the Hauraki Plains area, with a particular focus on items which could be reused or upcycled such as building materials. This development would likely occur over the next 2 to 3 years.
- Waitaki Resource Recovery Trust provides drop-off services for some rural waste streams, but does not currently provide on-farm collection services. Following the forum Waitaki Resource Recovery Trust considered it 'somewhat likely' that they would begin development of such services in the Waitaki region over the next 6 to 12 months.
- Innovative Waste Kaikoura is currently quite active in terms of farm plastic, providing a drop-off location for Plasback customers. Innovative Waste Kaikoura consider it 'somewhat likely' that they would seek to develop on-farm collection services for rural waste in the future, but no indicative timeframe is yet given.
- CReW / Pou Whakaaro does not currently provide any on-farm rural waste collection services but has indicated that they are 'somewhat likely' to pursue such services over the next 9 to 15 months with a particular focus on Whakatane, Edgecumbe and Kawerau. Such services would likely focus on recyclables, some plastics, paint and some chemicals.
- The Helensville Community Recycling Centre currently provides drop-off services but does not do any on-farm collection. They have indicated that it is 'very likely' that on-farm collection services would be developed for the greater Helensville area over the next 12 months, with a focus on silage wrap and baling twine.
- Caroline Jones who operates an on-farm collection service for rural waste between Dunsandel and Rakaia has struggled to gain traction in service provision for plastics, aluminium and cardboard domestic waste streams. Caroline now considers it 'somewhat likely' that the service provided could extend to commercial recyclables in the short term.

A final feasibility assessment for this option is presented later in this report.

3.5. EXPANDED TERRITORIAL AUTHORITY RECYCLING DROP-OFF HUBS

Feasibility:	Revised technical and economic feasibility assessed as moderate.				
Assessments:	Supply chain: Low		Life-cycle: High		
	Financial and Operational: Moderate		Risk: Moderate		
Type:	Council/TA Waste Hubs		Recycling of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

At the conclusion of Milestone 3 of this project, this options was considered to offer promise, but the apparent requirement under this option for council drop-off points to be staffed – based on the need for user-pays charging and the risk of illegal dumping – was seen as a significant barrier.

An approach was made to those councils that had identified rural waste as a priority and particular interest in the provision of extended recycling drop-off containers at rural hubs was expressed by:

- Whakatane District Council
- Mackenzie District Council
- Timaru District Council

The appointment of EnviroWaste as the service delivery contractor for Agrecovery has greatly impacted this option in a number of ways.

Firstly, Agrecovery already provides plastic container collection points at a number of council transfer stations, including:

- Waipukurau in Central Hawkes Bay
- Waitara in Taranaki
- Taihape and Marton in Manawatu
- Martinborough and Otaki in greater Wellington
- Mariri Resource Recovery Park in Tasman
- Richmond in Nelson
- Blenheim Resource Recovery Park in Marlborough
- Culverden and Pines Resource Recovery Park in Canterbury
- Roxburgh in Otago

Should Agrecovery / EnviroWaste add the collection of soft plastics to their business model, EnviroWaste has indicated that the addition of a receptacle for collecting soft plastics to sites where hard plastics are already collected under the Agrecovery programme would be relatively straightforward and would be covered in terms of cost based on the user-pays business model being developed.

Concurrently, Agrecovery has expressed an openness to providing additional permanent sites where these would be convenient to farmers. Such sites could consist of both hard and soft plastic collection receptacles.

In addition, EnviroWaste currently operates transfer stations in the following locations:

- Auckland (4 transfer stations)
- Taupo (6)
- Waikato (3)
- South Taranaki (7)
- Stratford
- New Plymouth (5)
- Waitara (which already has a container for Agrecovery containers)
- King Country (8)
- Manawatu-Wanganui (3)
- Horowhenua
- Kapiti Coast
- Mackenzie (3)
- Canterbury (2)
- West Coast

Each of these transfer stations presents a relatively straightforward location for the addition of an Agrecovery / EnviroWaste collection point for plastics and, potentially in due course, other waste streams. Of particular note is the inclusion of transfer stations in Farlie, Twizel and Tekapo. Mackenzie District Council has expressed a strong interest in providing expanded recycling services at these locations for farm waste.

As the activities initially contained within the Expanded Territorial Authority option have now become part of the discussions focused on extending Agrecovery's service provision in conjunction with EnviroWaste, this option is merged into the new Agrecovery / EnviroWaste Rural Waste Services option.

A final feasibility assessment and business case for this option are presented later in this report.

3.6. EXPANDED ROSE OIL RECYCLING SCHEME DROP-OFF HUBS

Feasibility:	Revised technical and economic feasibility assessed as high.				
Assessments:	Supply chain: Moderate		Life-cycle: High		
	Financial and Operational: High		Risk: Moderate		
Type:	Retail Store Drop-off		Recycling of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

It was concluded in Milestone 3 that rural retail stores present strong potential as a location for waste oil container collection receptacles. This view was endorsed by research with farmers and so discussions commenced with both ROSE, through local representatives Fulton Hogan, and with Farmlands, which had expressed an interest in being involved with the project.

After a number of discussions exploring the logistics of such an arrangement Farmlands and Fulton Hogan agreed to undertake a trial of a service at a small number of Farmlands stores to test customer uptake and collection requirements. This trial is expected to begin shortly and will be supported with joint marketing efforts and support by this project to engage with customers to determine the desirability of dropping used oil containers at Farmlands stores in rural locations. Given Farmlands extensive network of stores around New Zealand, such an option has considerable potential reach.

At this stage, Fulton Hogan has indicated that they will collect the containers, when full, at no cost to the farmer or to Farmlands. This is based on the value to Fulton Hogan of the materials they collect in the provision of service. It is likely, however, that the asset costs of placing bins in all Farmlands stores would require some external funding. Fulton Hogan has, however, agreed to fund the bins for an initial pilot.

A final feasibility assessment and business case for this option are presented later in this report.

3.7. FONTERRA SHARPS COLLECTION

Feasibility:	Revised technical and economic feasibility assessed as high.				
Assessments:	Supply chain: High		Life-cycle: High		
	Financial and Operational: High		Risk: Low		
Type:	Retail Store Drop-Off		Disposal of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

During Milestone 2 of this project Fonterra advised they were conducting a pilot that involved providing sharps containers to farmers and then allowing farmers to drop these containers off at local, participating veterinary clinics. This pilot is now underway, but Fonterra has advised that it will likely take farmers in excess of two years to fill the containers (pictured below) and that no decision has yet been made as to how to dispose of the containers.



Figure 2: Fonterra Sharps Pilot Container (Source: Fonterra)

In discussions with EnviroWaste focused on additional waste streams, the potential to collect these sharps containers at Temporary Pop-up Recovery Events has been considered. EnviroWaste has advised that they could provide a 120L bin at events to allow for collection of these containers. The bin would hold about 20 of the containers and cost approximately \$130 + GST to dispose of, or around \$6.50 + GST per container if full.

At this level, particularly if the cost is only incurred by a farmer every two years, the service would be very affordable. It is likely, however, that the per unit cost for disposal would be substantially higher if lower numbers of containers were received at an event.

To this end, Fonterra has been asked to consider whether it might underwrite the collection of these containers at events to enable continuity of service delivery without EnviroWaste bearing undue risk.

This could be done by Fonterra simply covering the cost of disposal and offering farmers a free service, or charging farmers a fixed fee and using this to offset the costs of disposal. Fonterra is currently reviewing these options.

A final feasibility assessment and business case for this option are presented later in this report.

3.8. TEMPORARY POP-UP RECOVERY EVENTS

Feasibility:	Revised technical and economic feasibility assessed as moderate.				
Assessments:	Supply chain: Moderate		Life-cycle: High		
	Financial and Operational: High		Risk: Moderate		
Type:	Drop off at one-off collection hubs		Recycling of Waste & Disposal of Waste		
Waste Categories:	Hazardous Wastes	Soft Plastics	Hard Plastics	Metal	Other Wastes

Temporary Pop-up Events are a new option identified during Milestone 3 as potentially offering farmers a low cost and convenient way to drop off a range of waste streams at a single location on a set time in their communities.

Following the appointment of EnviroWaste as the new service delivery contractor for Agrecovery in early 2017, events have become a key focus in service delivery discussion for Agrecovery and EnviroWaste. This option is seen as offering strong potential for achieving higher collection rates for Agrecovery's chemical, drum and container programmes, and also offers a platform on which new waste streams might be added.

The result of these discussions, and an extensive business model design process, are detailed in Section 4.2.

As this design has evolved and solidified during Milestone 4, its key elements have been presented to both farmers and territorial authorities and input sought as to appeal and likely effectiveness. The feedback obtained is summarised in the following sections.

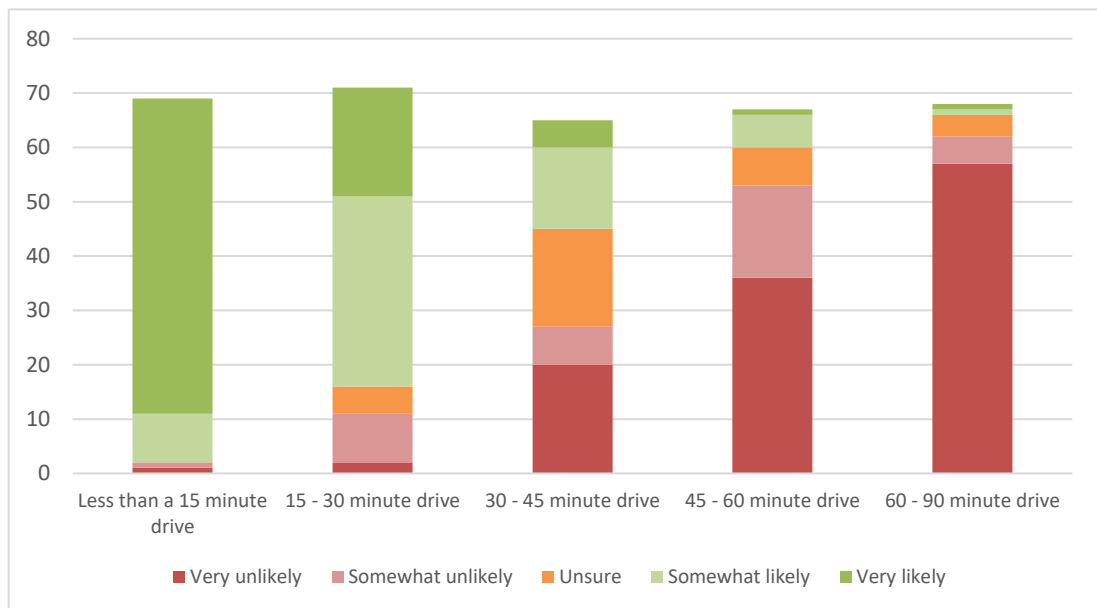
Events Farmer Survey

Following the conclusion of Milestone 3 a survey was prepared and issued to the farmers that participated in feedback surveys in Milestone 3. This survey explained the Temporary Pop-up Recovery Events concept to participants and sought feedback as to how these events might be undertaken.

74 responses were received from 35 different districts. Approximately 50% of respondents were from the dairy industry, 40% from beef and/or sheep, 10% from arable farms, 4% from deer farms and 15% from other farm types. Many respondents represent more than one farm type.

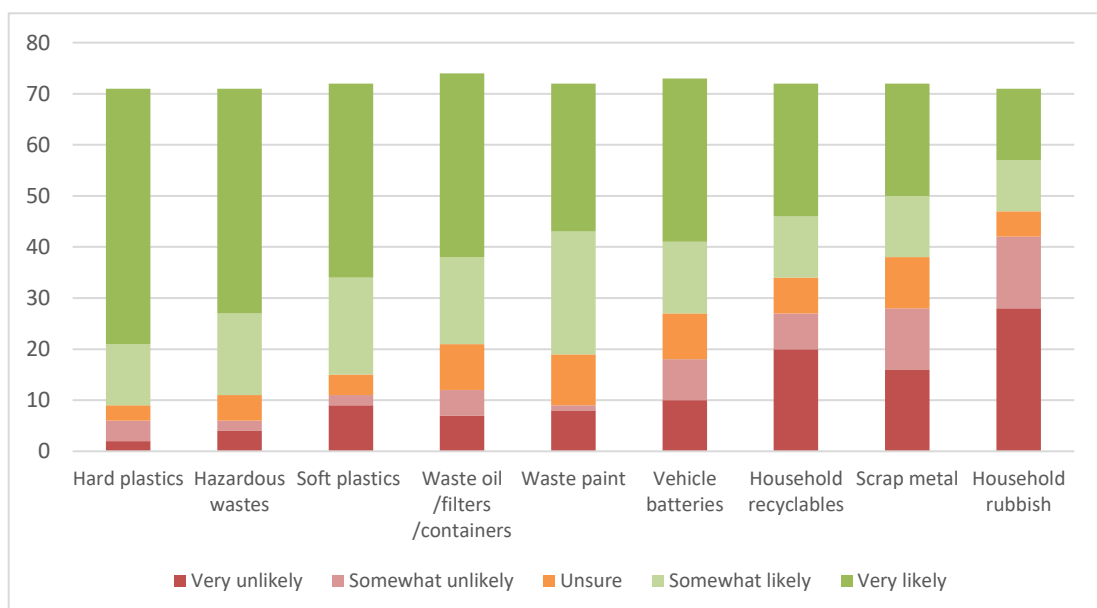
The key results from the survey follow.

1. Farmers were asked “How likely is it that you would take waste to a temporary recovery event, based on the time it would take to get there?”. Farmers were asked to indicate how likely it would be that they would attend an event based on a range of driving timeframes from their farms.



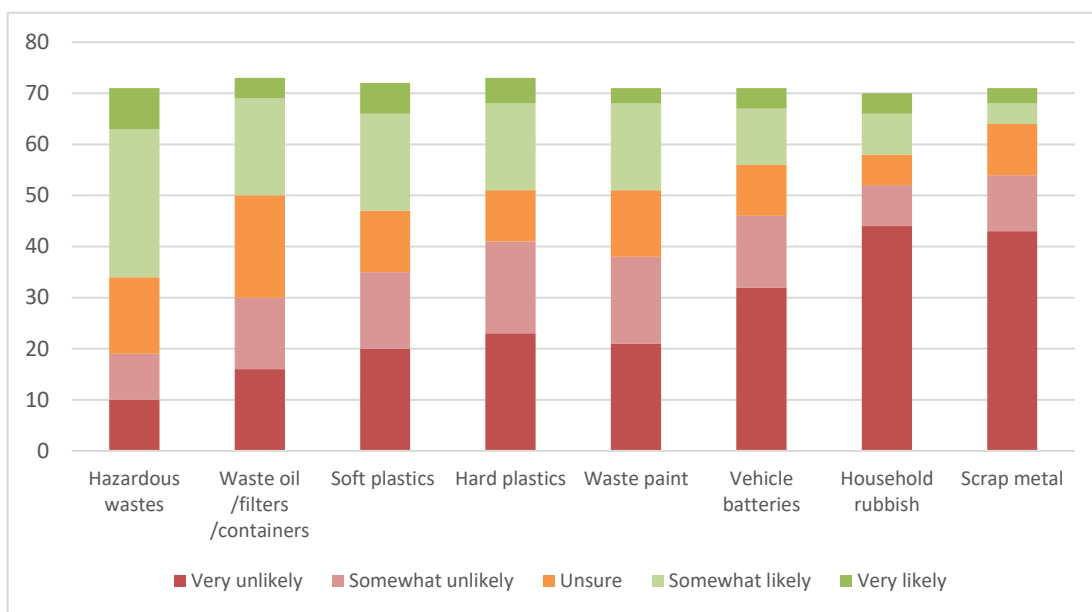
It is apparent from these responses that undertaking events at a location less than 30 minutes from farms is key. Indicated participation levels drop-off sharply at this point and it appears likely that farmers located more than a forty-five minute drive from an event are far less likely to participate.

2. Farmers were asked “How likely is it that you would take the following waste streams to a recovery event?”. Farmers were presented with the key priority waste stream categories under this project, as well as the option of domestic rubbish and recyclables. Given the desire under this project to offer a ‘one-stop shop’ for rural waste, domestic waste streams were added in to gauge levels of interest in extending events into this space.



The priority waste streams under this project were all reasonably likely to be taken to a recovery event based on responses received, but farmers appear less likely to take household waste streams. Scrap metal also rated poorly, perhaps as a result of challenges in transporting large scrap metal items. The overall levels of willingness to transport waste streams to an event here are particularly encouraging.

3. Farmers were asked “How likely is it that you would be willing to pay to drop-off the following waste streams at a recovery event?”. While no specific pricing was given – as this was unavailable when the research was conducted – the question sought to test the idea that waste streams would have to be paid for at an event. In fact it is hoped that some, if not many, of these would not cost, and some – such as scrap metal – may even provide owners with a return.



Hazardous wastes, waste oil/filters and containers, waste paint and plastics all scored reasonably high in terms of farmer willingness to pay but, perhaps unsurprisingly, scrap metal and vehicle batteries did not score well, nor did household waste streams. Once again, this result is encouraging in that across the focus waste streams for events there is at least a reasonable level of openness at the concept of having to pay to dispose of commercial farm waste.

4. Farmers were asked if there were any other waste streams they would like to see added to this list. Most responded that there were no desired additions, but some requested additions included:
 - Old appliances (although some would be included in the scrap metal category, plastic ones would not).
 - Old beekeeping frames.
 - Animal carcasses.
 - Tyres.

It is unlikely that these waste streams would be included in events.

5. Farmers were asked “Do you think it would be a good idea to run the events in conjunction with another event such as an A & P show?”. This question sought to reference the belief that some sort of community aspect to events may increase uptake and ownership by farmers.

Remarkably, 81% of respondents felt that events should be standalone, while only 19% felt they should be aligned with another event. Comments made it clear that events need to be undertaken at specific and strategic times of year, but that co-location with other events would likely be unappealing. Overall, dealing with waste seems to be a standalone activity in the minds of farmers, and not something to be combined with “a day out”.

Comments made in relation to this question included:

- “Standalone event in the quiet time of year so we have time to collect up all the waste on farm”.
 - “Persons attending occasions such as A & P shows have enough on their minds on these days”.
 - “Would probably drop off recyclables in old clothes so wouldn't attend anything else”.
 - “It might be difficult to take waste with you to an event as well as attend the event”.
 - “I think there would be very long queues if the events were held at or near A & P shows. And drivers won't want to park their trailers at the A & P show after offloading their waste”.
 - “Events should be tailored to follow on from high usage periods e.g. much silage wrap accumulates after autumn and winter feeding periods. Hard plastics in dairy industry could be collected at end season”.
 - “Many in the community are too busy with the show around show time”.
 - “The last thing we want to do when we are going "out" is to take rubbish and recyclables”.
 - “As a standalone it would be easier to manage for parking and unloading”.
 - “Competitors at the A & P show would not be at all likely to take both livestock AND rubbish/recycling”.
 - “I don't think getting dressed up for a show is compatible with disposing waste. Keep it focused on the task”.
6. Following on from the community focus of the previous question, farmers were asked “Do you think it would be a good idea to make the events community-focused, by having information stalls or family attractions such as a sausage sizzle and bouncy castle?”.

75% of respondents felt the events should not include these elements, whereas 25% felt they should. In considering comments made, it appears there is a common view that while community engagement and involvement in these types of events is advantageous, a waste event does not necessarily lend itself to leisure activities. It appears that events will need to endeavour to achieve a community element without ignoring the fact that some of the waste streams being transported and handled are far from family-friendly.

Comments made in relation to this question included:

- “It really depends on what your objective is. If it is education as well as collection, then by all means add the entertainment”.
- “Recycling must be carried out because of genuine free will - the motives are all wrong if people need to be enticed”.

- “I would have enough to make several trips to a collection depot so would prefer a standalone event. If you were carting waste oil or chemicals to a depot would you like to go to a sausage sizzle at the same time?”.
 - “50/50 about this idea. Sausage sizzle maybe. Children are getting well educated in schools regarding recycling and are often the drivers in the family home for this educating their parents!”.
 - “Not sure about the bouncy castle but would be an excuse for the communities to come together for something like this. Maybe a winner for the most recyclables received?”.
 - “Waste sorting is dirty work! I don't feel like eating or socialising after offloading waste!”.
 - “Food and drink is always a good plan. Make it a social occasion”.
 - “With the possibility of hazardous waste etc. it would be best not to encourage food sites”.
7. Finally, farmers were asked “Would you like to see your local district council support or partner in running recovery events?”. Events had been designed initially to be a partnership with territorial authorities, but feedback from some farmers indicated that the relationship between councils and the rural community is not always harmonious. This question sought to identify whether council participation would go some way towards improving this relationship in terms of waste management.

97% of respondents said they would like to see councils partner in this way. 3% said they would not. This is an overwhelming response suggesting a strong mandate for councils to support – and be seen to support – events of this nature.

Comments made in relation to this question included:

- “Apart from anything else it is in their interest to minimise waste. Encouraging communities to take responsibility for their own waste saves ratepayer money”.
- “Our local Council should be involved to prevent duplication of services that are already available”.
- “We pay a lot in rates to get a lot less service than our townie counterparts”.

Overall, the survey provided strong indications that the concept of Temporary Pop-up Recovery Events has merit, but that the design and staging of these events will need to be carefully considered to ensure strong uptake.

Events Farmer Focus Group

A further level of farmer engagement regarding Temporary Pop-up Recovery Events was undertaken in Milestone 4 in the form of a focus group undertaken in Geraldine (a likely event pilot location) with the support and assistance of Federated Farmers.

The group was convened to discuss the concept of pop-up events and to provide feedback as to how they felt events would work and what elements needed to be in place for farmers to embrace and utilise the model.

Attendee farmers represented a mix of dairy, sheep, beef and deer farms, all residing in the wider Geraldine community. The group was a mix of male and female farmers, with apparently differing levels of engagement in terms of rural waste.

The Temporary Pop-up Recovery Events concept was explained to the group and the reception was overwhelmingly positive. The group felt the events would likely succeed, particularly if the community was well engaged in terms of support and publicising them.

Key comments made by the focus group included:

- It will be important to ensure everyone knows well in advance of the event where and when it will be undertaken.
- Profiling upcoming events – as a good news story – in the local newspaper would be advantageous.
- Sending text reminders several days before the event would be useful.
- In each community in which an event is to be undertaken, it would be highly beneficial to identify local champions (such as those present in the group) who will promote the event to their peers and encourage them to participate. These champions may also be able to provide intelligence in terms of likely waste levels.
- Email and internet can be utilised as a communications medium, but connections are often slow and unreliable, so this needs to be kept to a minimum.
- Pre-registration for events is possible, but farmers can't be expected to give accurate information on all waste streams. Ticking a box to indicate broad volumes (such as 'less than 20 litres of paint' or '20 – 50 litres of paint') would be feasible. Asking for much more detail would be a barrier and may result in non-compliance or non-participation in events.
- Farmers could be encouraged to register in advance by putting them in the draw to win a substantial prize.
- It will be important to issue farmers a unique ID number and track what they bring. If this is done, then registration for future events can be simplified by referring to 'what you brought last time' and simply asking if anything has changed. It is likely that there will be some consistency in waste streams and volumes.
- Many farmers are starting to look more seriously at waste as they believe Farm Environment Plans will require more considered waste management.
- On-farm collections could be rationalised by a farmer providing a collection point for plastics for a group of farms. Perhaps that farmer could then receive free collections for their efforts.
- In terms of plastics collection, some farmers would like to be able to use a wool sack and wool press to compress soft plastics as much as possible and then simply pay for a 'collection ticket'.
- The ideal timing for events – at least in Geraldine – would be in July and September. If a single event was to be run, September would be preferable.
- Events should be on a weekday.
- While running a full family event would not be advisable, providing a sausage sizzle and coffee would be greatly appreciated. Providing something small for the kids would also be warmly received.
- The idea of events supporting local schools is very good. Perhaps each participating farmer could nominate the school they would like to support and a small donation is made based on these nominations. Schools could then be engaged to support the events and encourage parents to register, participate and nominate.

- It is likely a one-off event pilot will be flooded with volume because farmers will not be certain the opportunity will come up again. This may distort pilot findings.
- Soft plastics at events will provide some challenges, particularly if farmers bring large bags. There may need to be lifting equipment to get these off trailers or utes. To prevent this becoming unmanageable, it will be important to ensure farmers know they can get on-farm collection at the same time the event is on.
- It is very difficult to avoid contamination with silage and baleage wrap.
- Polypropylene bags (the types used for calf meal and fertiliser) are a key waste stream.
- Net wrap (used around baleage wrap) is a large and problematic waste streams for farmers.
- Lifestyle farmers particularly will value access to smaller liners for soft plastics as they will have lower volumes. Most larger commercial farmers that utilise baleage wrap will have large volumes to dispose of and will need an on-farm collection.
- It would be useful for any farmer to be able to go to a central reference point and find out what they can do with all the waste streams they have.

The farmers that participated in the focus group specifically noted that they both appreciated the opportunity to input and felt that the focus of the project – on providing inexpensive convenient options, rather than trying to ‘bully’ farmers into something – was both well received and likely to prompt behaviour change.

Territorial Authority Forum

The WasteMINZ Territorial Authority Forum “was established to create consistency and efficiency of service amongst territorial authorities through sharing knowledge and best practice”. The Forum meets regularly to share waste information that will assist territorial authorities to effectively plan around waste management and minimisation.

A presentation on the Project was made to the Forum in Wellington during Milestone 3. The presentation provided a broad overview of the Project but focused particularly on the Temporary Pop-up Recovery Events option.

The presentation posed three questions to attendees:

- Would your council be interested in partnering in such events?
- What value would you see for your council in participating in these events?
- What could your council contribute to ensure these events are successful?

Key responses were as follows:

1. Would your council be interested in partnering in such events?

The following councils indicated a potential willingness to participate in undertaking events in their areas:

Ashburton	Selwyn
Dunedin City	Southland
Gisborne	Tasman
Hastings	Thames-Coromandel
Hauraki	Timaru
Mackenzie	Waikato
Manawatu	Western BOP
Matamata-Piako	Waimakariri
New Plymouth	Whangarei

This response is strongly encouraging, particularly given the value placed on council involvement by respondents to the farmer survey outlined in the previous section. Any future event pilots would be undertaken in a subset of the regions listed.

2. What value would you see for your council in participating in these events?

The following responses were provided by councils:

- Better community engagement
- Better environmental outcomes
- Safer disposal of waste
- Better waste minimisation and diversion
- Waste data collection
- Puts responsibility on the rural sector
- Providing a practical solution before focusing on the problem

Once again, it is gratifying to see this kind of potential value ascribed to events by councils. It is apparent that those councils that have indicated a willingness to participate in events understand that there is considerable upside in the council being associated with and actively supporting such a new venture.

3. What could your council contribute to ensure these events are successful?

The following responses were provided by councils:

- Partnering with community/commercial events
- Provision of funding, particularly for hazardous wastes
- Provision of education opportunities – e.g. compost workshop
- Communications, publicity and marketing
- Supporting behaviour change
- Provision of event venues

There are clearly a number of different ways in which councils could support events, both by publicising their presence, aligning funding with service provision and potentially providing add-on educational activities to events.

Overall, the level of interest from councils in Temporary Pop-up Recovery Events was very strong with a clear recognition that the requirements of councils in participating – which would not be extensive – are more than offset by the value councils would receive in seeing these events undertaken and being associated with them.

Engagement with Timaru District Council

Following the TA Forum, further support was sought from Ruth Clarke at Timaru District Council to provide more detailed information as to likely council requirements and potential assistance that could be provided in relation to events. Key determinations made in these discussions included:

- Transfer stations would be preferable locations for events, especially given the presence of hazardous waste streams. Handling these waste streams at other locations may require a resource consent.
- Ensuring all waste is taken off site at the end of the day will avoid considerable security challenges on site.
- Councils can promote events through a range of different channels including newspapers, community newsletters, online presence, service centres, flyers attached to rates notices and through school connections.
- Councils are likely to be interested in supporting community elements attached to events, but will need to be clear that this is their role.
- Data on waste volumes collected at events would be very valuable to councils.
- Councils may be able to provide personnel to ‘marshal’ events.
- Parking and traffic management may be an issue, and a traffic management plan template may need to be prepared to make this process easier in multiple regions.
- There will need to be a detailed health and safety plan in place.
- Pre-registration will assist with traffic and waste volume management.

These considerations have been incorporated into the design of the events as detailed later in this report.

As Milestone 4 has progressed it has become clear that Temporary Pop-up Recovery Events are a key component of the overarching strategy being developed with Agrecovery and EnviroWaste. Should Agrecovery and EnviroWaste look to extend the waste streams collected, both will – in all likelihood – focus on events as a primary delivery vehicle for new services. In addition, as further explained later in the report, it is quite possible for Agrecovery and EnviroWaste collectively to handle most – if not all – of the priority waste streams under this project through events. For these reasons, this option is merged into the new Agrecovery / EnviroWaste Rural Waste Services option.

A final feasibility assessment and business case for this option are presented later in this report.

4. OPTION BUSINESS CASES

4.1. BUSINESS CASE METHODOLOGY

Milestones 2 and 3 of this project have involved the collection, analysis and assessment of considerable volumes of information for the options being pursued under this project. This work has seen the initial options identified in Milestone 2 reduced and consolidated down to eight options in Milestone 3, and now to five.

In considering how to properly finalise evaluation of the remaining options, it is worth revisiting the barriers identified in Milestone 2 to farmer usage of alternatives to burning, burying and bulk storage of waste. The key barriers identified were:

- Costs
- Inconvenience
- Lack of Incentives
- Lack of Awareness
- Lack of Economic Viability

In addition to this, the following factors were identified in Milestone 2 as being critical to economic viability of services:

- *Supply chain participants*: services must have willing, motivated and committed participants at all stages of the supply chain.
- *Customer demand*: services need to be able to secure and sustain a reasonable level of customer demand at a service price that allows for profitability.
- *Waste contamination levels*: services need to be able to deal with reasonable levels of waste contamination.
- *Inconsistency and unreliability of volume*: services need to secure consistent volumes or be able to deal with inconsistent volumes of incoming waste.
- *Unreliability of novel technologies*: services need any technology they rely on to be proven, scalable and reliable.
- *Increasing compliance requirements*: services need to have the capability, resources, systems and processes in place to comply with all relevant government regulation.
- *Inadequate business model or lack of capital*: services need to have a robust and sustainable business model, be adequately capitalised for the proposed model, and have the capability to execute it.
- *Volatility of output markets for processed waste*: services need to have secure access to output markets or the financial means to be able to cope with uncertainty in this regard.

The final evaluation of economic and technical feasibility for the remaining options must be mindful of both the barriers to farmers accessing services currently, and the requirements for economic feasibility for services. This feasibility then, in turn, informs the business case for each option.

At its simplest, a business case is a justification to move forward with a commercial venture based on good evidence. It is an argument supporting a decision to move forward with a plan of attack, backed by compelling evidence.

The business cases presented in this report will consider the following:

1. *Business Model and Process*: To what extent is the business model determined and does it align with the requirements of this project and the needs and expectations of farmers? How will the service actually operate in a live environment and are there any material gaps in service delivery?
2. *Review of Supply Chain, Financial Models and Risk Profile*: With reference to the economic factors and barriers listed above, does the business model actually have the necessary elements in place – or robust plans to deploy these - to function? Will the service offer strong value to providers and to customers? Are the risks of the project acceptable and are mitigation strategies in place?
3. *Final Feasibility Assessment*: Given the status of the business model and the consideration of supply chain, financial models and risk, does the option present a compelling case for feasibility in terms of the objectives of the Project?
4. *Business Case for Implementation*: Is there a strong case to be made that the option should be pursued and implemented, subject to pilot trialling? Specifically, the following aspects are considered:
 - a. *Strategic justification*: Does the option make overall sense for farmers based on what we understand about their needs and challenges? Does the option make strategic and commercial sense for suppliers?
 - b. *Market validation*: Do we have any evidence that farmers will utilise the service and pay the indicated costs?
 - c. *Overall cost-benefit analysis*: Do the potential benefits from the proposed service outweigh the likely costs and risks?
 - d. *Deployment pathway*: Is there a clear and reasonable pathway to deploy the service and what are the timeframes involved?
5. *Implementation recommendation*: With reference to all the information contained within the business case, is there a justification for proceeding towards piloting and implementation?

A business case requires that the business model be feasible, but such feasibility does not necessarily justify implementation. A business case for implementation requires that the business model make sense both for the organisations proposing it, and for the market that is being asked to embrace it.

Implementing a new business model is both risky and taxing on an organisation so the business case must ensure that the organisation is strategically aligned with the option and that the option will deliver compelling net benefit both internally and to the market.

4.2. OPTION 1 – AGRECOVERY / ENVIROWASTE RURAL WASTE SERVICES

4.2.1. Business Model and Process

Considerable effort and discussion has been facilitated between Agrecovery and EnviroWaste to develop a business model for coordinating a range of potential waste services under the Agrecovery brand. It should be noted that, at this stage, the board of Agrecovery has agreed to pilot events that may include new waste streams, but that any ongoing involvement with EnviroWaste on new waste streams under the Agrecovery brand will require subsequent board approval.

The partnership between EnviroWaste and Agrecovery does provide some flexibility, however, in that waste streams that Agrecovery does not wish to explicitly embrace and cover under its brand may be directly managed by EnviroWaste – under its own brand – concurrently with service provision to Agrecovery.

This will, of course, require assurances regarding cross-subsidisations or service dilution but Temporary Pop-up Recovery Events, particularly, provide a strong platform at which EnviroWaste could receive waste streams beyond those included in the Agrecovery programme.

The overall business model for Agrecovery / EnviroWaste Rural Waste Services may be visualised as follows:

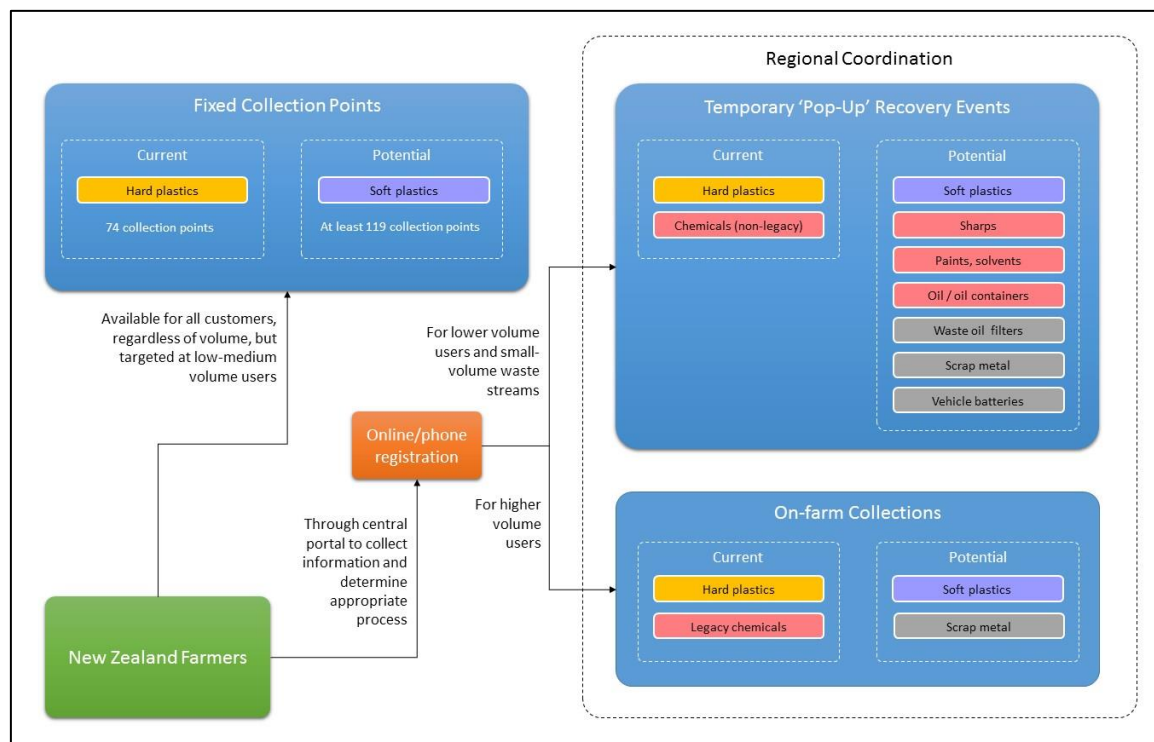


Figure 3: Agrecovery/EnviroWaste Business Model

Temporary Pop-up Recovery Events

Under its Agrecovery contract, EnviroWaste is already required to undertake 10 events per year. This refers to the events that Agrecovery currently undertakes focused on supplementary plastic collections in areas where sites are not conveniently located. Agrecovery also undertakes additional events to collect chemicals.

Key in the business model for pop-up events is a simultaneous regional approach whereby a local event would be coordinated with on-farm collections. This enables EnviroWaste to focus resources on a particular region at a given time to minimise transportation movements and, hence, costs.

To participate in events, it is likely farmers will need to register online on the Agrecovery website, noting:

- Basic demographic information (to support analysis) and personal details. Farmers will be given a unique identifier that can be used in all Agrecovery transactions from this point forward.
- Approximate volumes of relevant waste streams. This information gathering will be designed to ensure minimum hassle for farmers and only gather essential data to support planning and logistics.

It is envisaged that the farmer will then receive an 'action plan' that describes what they should do with individual waste streams logged. Where minimum volumes are met, farmers will be informed of opportunities for on-farm collection. Where there is another convenient provider for waste streams (such as the ability to drop waste paint at a local council transfer station) this will also be noted.

Farmers will then be advised what wastes they can bring to an event, what state they must be in, and how they should be prepared and packed for safe transportation and ease of unloading at the event.

The events would be run essentially as informal 'joint ventures' between local territorial authorities, Agrecovery and EnviroWaste, with Agrecovery providing ultimate oversight. In all likelihood, council transfer stations or other council-owned properties would be used for the events given the potential resource consenting issues at other locations.

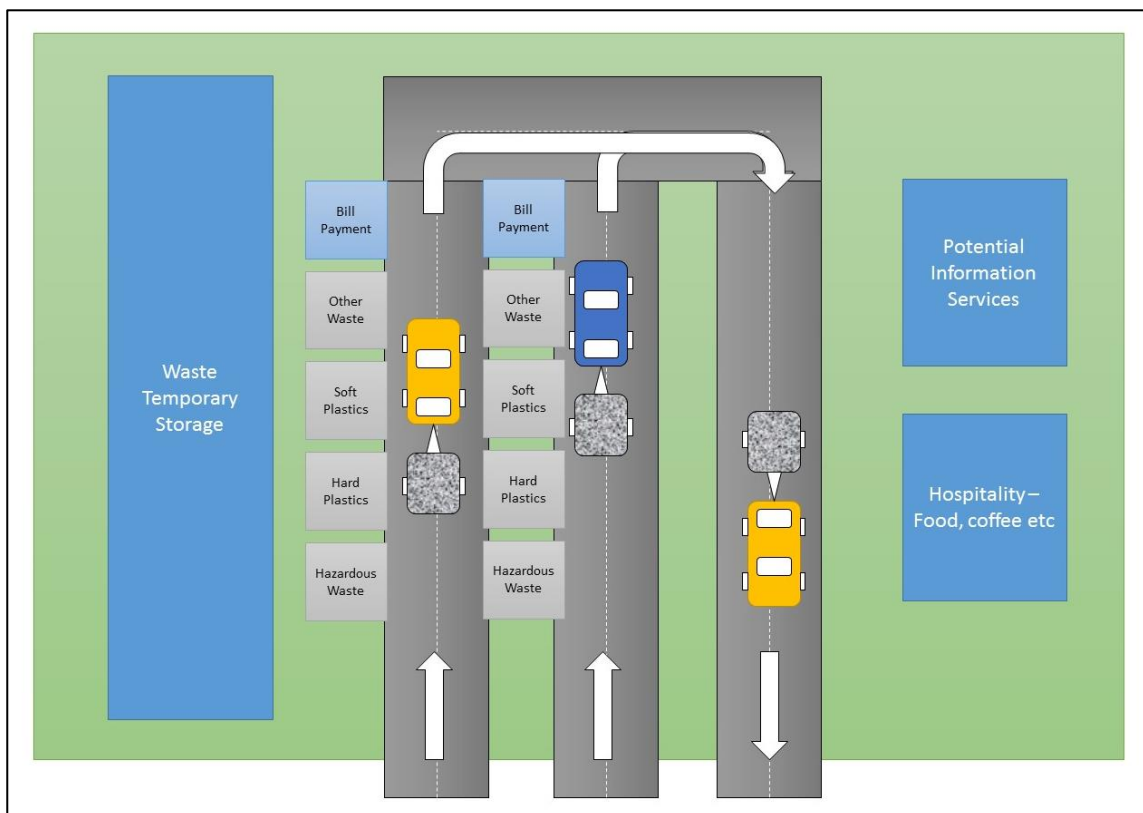


Figure 4: Conceptual Pop-up Event Layout

Local council support would be sought in terms of publicity, ensuring appropriate traffic management plans are in place and potentially for the provision of staffing support on the day. Councils may also wish to have staff present on the day to provide support and advice to farmers or to otherwise engage and build relationships with these communities. Other waste-related programmes and services for farmers could be promoted at the events.

All other aspects of service delivery on the day would be undertaken by EnviroWaste, including those required under contract to Agrecovery. Agrecovery would provide coordination for the events and prepare and communicate both site plans and health and safety plans to relevant personnel. Agrecovery is currently recruiting a national coordinator, and this role will likely include coordination of pop-up events.

Other than publicity undertaken by councils, all marketing and management functions for the events would be undertaken by Agrecovery. Agrecovery has a strong track record in publicising events as the leading agricultural waste brand, and a key goal in undertaking events of this scale and scope will be in ensuring all farmers in the region are well informed and well prepared to participate.

On arrival at the event, farmers will need to provide their unique identification number so waste can be tracked against the user. Farmers will be provided with a tracking sheet that shows waste streams and has space for EnviroWaste staff to enter volumes or weights and any applicable charges. This information, which will be carefully managed and aggregated for privacy reasons, will be extremely valuable both to the service providers in service planning, and to the local council in terms of better understanding rural waste volumes and activities.

The farmers will proceed through one or more lanes at the event to systematically remove waste from vehicles. It is intended that this sequence of waste receiving points will be notified in advance and farmers advised how best to pack vehicles to ensure ease of removal of waste in the right order. Allowances will have to be made, however, for failures to follow this advice. As each waste stream is removed, the weight or volume will be measured and notified, and farmers will proceed or move wastes to the next station. At the end of the line farmers will have the opportunity to pay for any waste costs via a mobile EFTPOS terminal.

In terms of waste costs to farmers, the regime for chemicals and container plastics will continue as is currently provided by Agrecovery. This will mean that most chemicals and hard plastics are able to be dropped off at no cost.

Considerable work has been done with EnviroWaste to determine, with some accuracy, the costs for soft plastics. The intention with pop-up events is that, rather than the larger 200 – 300kg capacity liners used by Plasback, those that wish to bring soft plastics to an event will utilise a smaller liner with a capacity of approximately 50 – 60kg.

This is obviously a more manageable size and is aimed at those utilising lower volumes of plastic. While final pricing is subject to confirmation by both EnviroWaste and, assuming involvement in soft plastics, Agrecovery, an indicative price of \$15 – 16 + GST for this smaller liner has been presented. This compares very favourably to a cost of approximately \$57 + GST for Plasback's option, albeit the latter includes a collection fee.

Expected waste costs for waste streams beyond plastics and chemicals will depend, in all likelihood, on the region in which the event is undertaken. Waste costs will also need to be tested in a piloting environment and adjusted based on volumes received.

Other waste stream options include:

- *Sharps*: Connecting with the Fonterra pilot, EnviroWaste has provided an indicative price of \$129 + GST to dispose of a 120L container full of smaller sharps collection receptacles. This is based on a 'worst case' transportation option (Gisborne), so may be less expensive in other regions. This equates to approximately \$6.45 + GST per container.
- *Paint*: Assuming an event receives 100 10L water-based paint containers EnviroWaste would charge approximately \$25 + GST per container.

EnviroWaste has advised that it is able to handle 'most other waste streams' but that these would need to be priced on a region-by-region basis closer to the trialling of events and bearing in mind fuel costs at that point in time. These discussions will be finalised well in advance of the promotion of any pilot events.

The current status of development in anticipation of trialling events is as follows:

- Agrecovery has approved proceeding with pilot trials including events, but wishes to hold these after 1 July, 2017 when EnviroWaste officially commences service delivery.
- EnviroWaste has indicated that, should they be required to do so, they can initiate events prior to 1 July, 2017, but are certainly comfortable with commencing trials soon after this date.
- Approximately 20 local authorities have indicated a desire to support events, and a smaller number have been directly engaged to begin preliminary discussions around pilot trials in winter of 2017.
- Early indications suggest that the optimum time for event pilot trials is likely to be between July and September. This aligns well with the project timeframes.

On-farm Collection

On-farm collection of hard plastics and chemicals will continue to follow the current business model offered by Agrecovery, albeit with a new service provider. To enhance service delivery and seek to reduce collection costs, EnviroWaste is looking at a range of alternative collection models including backhaulage of recyclables utilising existing business relationships.

EnviroWaste has also strongly communicated its desire to access soft plastics volume, and to pursue a more complete service for farmers by collecting soft plastics from farms alongside hard plastics. As with the ability to drop-off soft plastics at events, EnviroWaste has produced an indicative price for on-farm collection of soft plastics, to which a margin has been added to provide for an Agrecovery overhead and costs associated with producing liners for plastics collection. While Agrecovery has not confirmed an intention to offer a full, nationwide service for soft plastics, the price gives a more representative indication as to what customers are likely to pay should pilots be successful and Agrecovery commit to overseeing service provision.

The price indicated for on-farm collection of soft plastics is approximately \$43 + GST for a large liner, equivalent to that currently offered by Plasback. This offers an approximate one-third saving over Plasback's offering. Under a full Agrecovery service, these liners would be available for purchase at rural stores and on the Agrecovery website. To qualify for on-farm collection, farmers would be required to be in possession of 6 full large liners or 20 smaller ones.

EnviroWaste's business model for such service delivery is to offer a rostered collection for soft plastics based on demand, such that regular regional collection rounds would be undertaken based on high-demand times of year. Where a localised regional demand meets a certain threshold – likely 30 – 40 liners – a supplementary collection would be triggered. To support this option, local coordination and aggregation of volume by farmers would be encouraged and facilitated.

Farmers would register for collection via the Agrecovery website and information would be provided to ensure farmers understood the requirements for collection and the degree of contamination that would be tolerated. An EnviroWaste truck would then collect the liners in a given window. Email and/or text reminders of this timeframe would be sent out by Agrecovery.

A key element of making this service work will be tracking users and understanding user patterns of behaviour so that services can be provided in a timely manner and opportunities are taken to cluster collections and proactively communicate with users to ensure the maximum volume of plastics are collected in a given run.

Alongside ordinary scheduled rounds, collections would also be aligned with pop-up events so that a region is 'blitzed' in terms of waste at a specific time. This will both aid in terms of transportation logistics, but also provide predictability in terms of service provision and an extra impetus for farmers to utilise services.

In addition to soft plastics, EnviroWaste is currently in discussions with a number of metal recyclers to determine the best process for collection of larger volumes of scrap metal from farms in conjunction with pop-up events and regional on-farm collections. This process may be as simple as registrations on the Agrecovery website being forwarded to a local or national scrap metal recycler for actioning, or may involve EnviroWaste in a more hands-on role. Ultimately this is likely to be tested in various configurations at pilot events and is unlikely to involve a cost to farmers.

Fixed Collection Points

In addition to on-farm and event options, and as part of its contract with Agrecovery, EnviroWaste will also be collecting hard plastic containers from Agrecovery's existing network of 74 collection points. These are located at a mix of rural stores, rural contractor yards, transfer stations and other rural locations. With EnviroWaste commencing service delivery for Agrecovery on 1 July 2017, up to 45 additional sites controlled by EnviroWaste may be added to this network to improve access for farmers.

EnviroWaste is also currently finalising designs for bespoke collection trucks that are equipped to undertake rapid preliminary processing of both hard and soft plastics on site. It is likely that the vast majority of plastic collected at fixed sites will be collected on a rostered basis, with supplementary collections undertaken only where volumes are greater than normal. EnviroWaste has indicated that plastic collected will be transported to a number of hubs around the country then forwarded to relevant processing sites based on the type and condition of plastic.

EnviroWaste has confirmed that the addition of bins for the drop-off of soft plastics at Agrecovery sites is a simple addition to its model and has, as noted above, designed a transportation solution that would enable it to handle both hard and soft plastics from a single location.

While it is likely that the drop-off of soft plastics at a rural hub will be most convenient for those with smaller volumes, and using small liners, these sites provide a useful consolidation point for higher volumes and this may be tested if pilots are undertaken.

As noted previously, there are already a number of councils with staffed transfer stations that are keen to provide collection points for soft plastics. It is intended that this concept be tested in the coming months to determine the demand for such services. Farmers would be required, of course, to purchase prepaid liners for soft plastics to cover collection and processing costs. This would then avoid money changing hands at council sites, but cursory checking of plastic contamination levels would still be required.

Overall, the level of development and agreement with regard to an overarching business model for a broader service delivery by Agrecovery and EnviroWaste is high. While both parties are cautiously approaching this space and will seek to ensure strong market support and service feasibility before committing broadly, there is strong alignment as to how service delivery should work, and this features a high degree of user-focus. Under the proposed business model, farmers are likely to be able to access a more convenient service at lower costs, leading to higher volumes of waste being captured.

Based on this information, the overall feasibility of the business model for the Agrecovery / EnviroWaste Rural Waste Services option is considered **HIGH**.

4.2.2. Review of Supply Chain, Financial Models and Risk Profile

Supply Chain

The supply chain for an overall Agrecovery / EnviroWaste Rural Waste Services option now becomes quite complex, as follows:

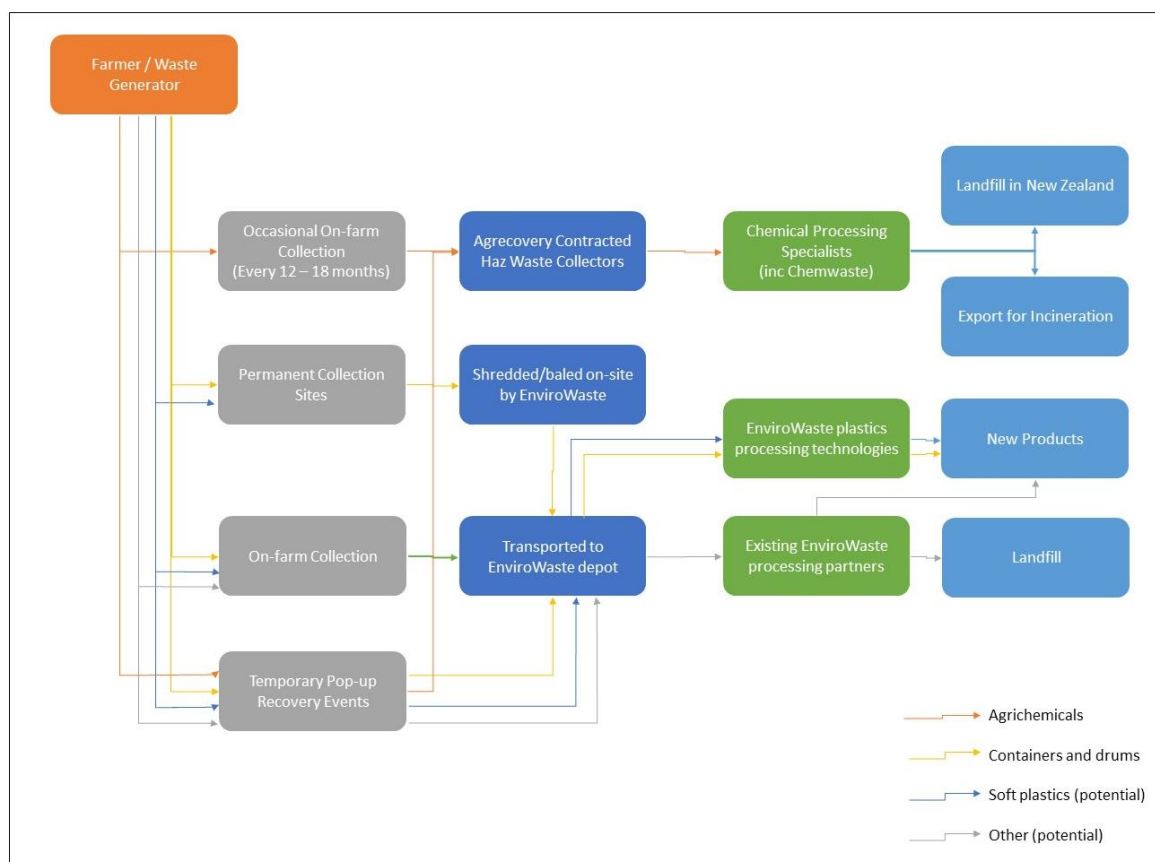


Figure 5: Agrecovery / EnviroWaste Supply Chain Model

While conceptually, the supply chain for this model is complete, in practice there are still a number of gaps that will require consideration as the potential model is deployed:

- While the supply chain for key waste streams (hard plastics, soft plastics and chemicals) is largely determined, secondary waste stream 'add-on' options such as paint and scrap metal require further development and will likely be region specific.
- The Erema plastics processing plant being developed by EnviroWaste is not yet fully operational and is not now expected to be so prior to July 2017. Likewise, none of the other in-house options for plastics processing identified by EnviroWaste are yet operational. While it is apparent that EnviroWaste is well resourced and highly motivated to ensure these technologies work in practice, until the plants are operational it is likely plastic will be processed by existing technologies such as that operated by Astron Plastics in Auckland.
- EnviroWaste has not yet finalised its collection methodology for events, permanent sites or on-farm collections. This is not necessarily problematic, as this appears to be more about regional flexibility and optimisation than a lack of clarity, infrastructure or resources.
- There is currently a lack of clarity and information concerning central government funding for 'legacy' chemical on-farm collection. It is expected this situation will be better understood in the coming months.

Overall, there is a reasonable degree of confidence in the potential supply chain for service provision under this option. While there are still some gaps and unanswered questions it must be remembered that EnviroWaste does not officially begin service provision under contract in this space until 1 July 2017. This is considered to offer ample time for outstanding arrangements for secondary waste streams to be finalised.

Based on this information, the overall feasibility for the reviewed supply chain for the Agrecovery / EnviroWaste Rural Waste Services option is considered **HIGH**.

Financial Model

Focusing on the two primary options from Milestone 3 that the new Agrecovery / EnviroWaste Rural Waste Services option comprises ('Agrecovery Expanded Waste Stream Collection' and 'EnviroWaste Plastics Collection and Recycling'), the following were key concerns regarding the overall financial model:

- The capital requirements for the completion of EnviroWaste's Erema plastics processing plant.
- The impact of contamination on profitability.
- The return on investment offered by likely initial collection volumes versus capital investment.

As the financial model being pursued by EnviroWaste has been better understood, these financial model concerns do not appear to present a significant barrier to successful operation of the overall model. Investment in the Erema plant has already been committed, and establishing a supply chain to access large volumes of plastic is a necessary element in ensuring a strong return on investment for the plant. Initial volume requirements have largely been met through EnviroWaste's pilot polypropylene bag initiative with Ballance and Ravensdown – which may also be incorporated into this option - and the addition of volume from Agrecovery customers will significantly improve profitability and return on investment for this technology.

It is understood that the expected levels of contamination have caused much of the delay and ongoing investment in the Erema plant. Accepting that farm plastics are likely to be reasonably contaminated, EnviroWaste has invested substantially in leading edge technology to remove this contamination prior to processing the plastic. The processing plant itself is not currently believed to be the focus of efforts in finalising the Erema plant, but rather the 'up front' decontamination and washing technologies.

While it cannot be said definitively that this plant will effectively cope with the likely levels of contamination seen, EnviroWaste does have contingencies in place for lower grade plastics and has unquestionably resourced this function beyond what might reasonably be expected.

While the exact financial details of the contractual arrangement between Agrecovery and EnviroWaste are commercially sensitive, along with the price EnviroWaste is able to secure by processing plastics through the different options available to it, including the Erema plant, these details have been reviewed by the author and are considered to be robust and commercially viable. EnviroWaste's entire business model is based not around profitability of collection, but around profitability of resource recovery.

EnviroWaste has secured a fee from Agrecovery for basic services, which covers the cost of its collection activities. This is a very reasonable fee based on the extent of EnviroWaste's network, and thus the relatively short distances that must be travelled to collect waste. Once waste is collected, EnviroWaste then grades the plastic based on type and levels of contamination, and will process (once all technologies are in operation) as follows:

- Higher grade, cleaner plastics will be processed through the Erema plant to be turned into new agricultural products. EnviroWaste has direct control over this supply chain and so can reliably sell this output at virtually unlimited levels. Again, the actual usage is commercially sensitive, but EnviroWaste's intentions in this regard are considered commercially sound.
- Lower grade plastics will be processed through a different technology that EnviroWaste is deploying. This is commercially sensitive, but would return only about one-third the value of processing through the Erema plant.
- Astron Plastics, the current recipient of plastics from Agrecovery, will continue to provide a contingency option until other options are available. Export markets are also available, but are considered a last resort.

The current volume target for hard plastics under Agrecovery is 300t for the 2016/2017 year. The estimated volume of plastic in the market, including levied plastic under the Agrecovery programme, is approximately 1,000t per annum. EnviroWaste has indicated a target for the 2017/2018 year of 500t. At this level, which is considered feasible based on the additional initiatives EnviroWaste and Agrecovery are pursuing, the option is likely to be strongly profitable.

The potential addition of soft plastics would improve profitability strongly under this option, given the premium value of this plastic and the low marginal cost of collection. This does, of course, depend on the willingness of farmers to pay for soft plastic collection or drop-off. Obviously, this currently happens to some degree under the Plasback service, but with low collection rates. The enhanced service offering proposed by EnviroWaste, coupled with a substantially lower indicated price than Plasback, would suggest that this service is likely to gain traction in the market. This may take some time, but it is apparent that EnviroWaste is focused and committed to securing this waste stream in large volumes.

Based on this information, the overall feasibility for the reviewed financial model for the Agrecovery / EnviroWaste Rural Waste Services option is considered **HIGH**.

Risk Profile

Focusing on the two primary options from Milestone 3 that the new Agrecovery / EnviroWaste Rural Waste Services option comprises ('Agrecovery Expanded Waste Stream Collection' and 'EnviroWaste Plastics Collection and Recycling'), the following were identified as key risks:

- On-farm collection costs may be too high (*High risk*).
- Waste contamination may not be easily dealt with (*High risk*).
- Additional costs may be incurred to deal with contamination (*High risk*).
- Plastics processing technology may not function as desired (*High risk*).
- Timeframes for full operation of the new plastics plant may be unacceptably long (*High risk*).
- Output quality from the plant may be poor or inconsistent (*High risk*).
- A new business model including new waste streams may prove unprofitable (*Moderate risk*).
- Implementing new waste stream services may take an unacceptably long time (*Moderate risk*).
- New services may be uneconomical for more outlying rural areas (*Moderate risk*).
- New service uptake may be unacceptably low (*Moderate risk*).
- Waste volumes may be low or inconsistent (*Moderate risk*).
- Significant competition may be faced (*Moderate risk*).
- Waste volumes may overwhelm processors (*Moderate risk*).
- Development timeframes for new waste processes may prove unacceptable (*Moderate risk*).
- Some waste may be landfilled if contamination is unacceptable (*Moderate risk*).
- The new plastics plant may struggle with differing waste streams (*Moderate risk*).
- Scale-up requirements for the plastics plant – from a single to a second plant – may prove unacceptably long (*Moderate risk*).
- The business case for a second plant may not prove compelling (*Moderate risk*).
- Transportation logistics may prove unacceptably expensive (*Moderate risk*).
- Issues with new plant operation may result in stockpiling (*Moderate risk*).

In summary, the risks in this option come from mixing a new service process and network with a new processing technology, and are further complicated by the presence of contamination in the waste streams to be recycled. There can be no doubt that this option presents significant risk, but this risk is somewhat mitigated by the following factors:

- EnviroWaste is extremely well resourced and committed at the highest levels to making recycling of plastics work at a large commercial scale. The investment has focused on the appropriate aspects of the technology – washing and decontamination – and test run results have apparently been encouraging. The bigger risk here is likely to be around timeframes. Additional delays in the Christchurch Erema plant reaching full operational status are not unlikely. The mitigation strategy in place for this eventuality is simply that plastics will be rerouted through Astron Plastics. This will negatively impact EnviroWaste in terms of margin, but is unlikely to derail this option.

- Agrecovery is taking a very cautious approach to new service delivery based, in all likelihood, on their unsuccessful venture into soft plastics collection in the past. The board is seeking to trial any new waste streams very carefully and systematically and, with the aid of its new internal management capability, will ensure that any service provision is well executed and conceptually proven before launching into anything at scale. The bigger risk is, therefore, that deployment timeframes will be longer than may be desirable, or that unsuccessful or unsatisfactory early activity – particularly in the piloting phase – may ‘scare Agrecovery off’. Mitigation of the risk will come in the form of very well thought out and executed service pilots.

The merger of a number of options under this project and a move towards a largely centralised service delivery model through Agrecovery and EnviroWaste necessarily raises risks around creating a monopoly in the rural waste services sector. Should new services be provided under this option, there is the potential to diminish the market share or even threaten the viability of other service providers such as Plasback. It is possible – though not likely – that EnviroWaste could initially pursue low pricing, and then increase this once established in the market. Likewise high levels of service may be provided initially, and these may decline in the absence of competition.

Ultimately, there are two safeguards to this scenario:

- The intention of this Project is to see services provided primarily under the Agrecovery banner, and not by EnviroWaste directly. This is also in accordance with both organisations’ stated intentions. As a non-profit entity that has a focus on addressing persistent rural waste issues Agrecovery is perfectly positioned to act as a guardian and overseer in relation to rural waste services to ensure that service delivery is optimal and pricing is as low as is sustainable. Agrecovery has already shown a willingness to tender services and change service providers if in the best interest of its programmes and there is no reason to think it would not do so in the future if there was an unwelcome change in service delivery standards.
- While undesirable from the perspective of this Project, farmers can always return to the predominant current practices of burning, burying or bulk storing waste if service provision becomes unattractive. In fact, for a service provider to remain viable, they need to ensure that costs are reasonable and that a basic level of service is maintained because farmers always have a ‘free and convenient’ option that they can fall back on.

Based on this information, the overall reviewed risk profile for the Agrecovery / EnviroWaste Rural Waste Services option is considered **MODERATE**.

4.2.3. Final Feasibility Assessment

The following feasibility and risk assessment results have been concluded regarding the current state of the Agrecovery / EnviroWaste Rural Waste Services option:

Category	Assessment/ Feasibility
Business Model	HIGH
Supply Chain	HIGH
Financial Model	HIGH
Risk Profile	MODERATE

It is probable that there is no aspect of the overall model for the Agrecovery / EnviroWaste Rural Waste Services option that would fundamentally threaten its feasibility. This option brings together two very strong industry players that have a high level of market recognition, a strong customer focus and considerable collective resources.

There are still gaps and risks in the model, and the state of EnviroWaste's plastics technology stands out as a significant risk, but the strategic nature of expanded service delivery to EnviroWaste means failure at this point must be considered unlikely.

Likewise, Agrecovery's caution in considering new services may suggest an unwillingness to expand into new waste streams, but the organisation's mandate and unwavering focus on improving waste outcomes in the rural sector would suggest that the more likely outcome is a slower rollout with very careful service monitoring. This is far from an undesirable state of affairs.

Overall, it is the combined strategic focus, determination and capability of these two organisations that forces the conclusion that this option is definitely feasible.

Based on this information, the overall reviewed feasibility for the Agrecovery / EnviroWaste Rural Waste Services option is considered **HIGH**.

4.2.4. Business Case for Implementation

Strategic justification

With a business model that is considered feasible, the business case for implementation by Agrecovery and EnviroWaste requires a strong strategic basis for actually deploying the business model.

As a non-profit focusing on improving rural waste outcomes, the strategic motivation to pursue an expanded and enhanced service offering for Agrecovery is apparent. This is accepted at a board and operational level.

The challenge for Agrecovery strategically is that its current support base comes from the chemical manufacturers that currently participate in its product stewardship scheme. These companies have supported Agrecovery since its inception, including seeing an unfortunate failure in Agrecovery pursuing soft plastic collections some years ago. It is broadly understood that the current service offering is markedly different from the previous initiative, but obviously some hesitation remains.

While Agrecovery is committed to piloting new services it must ensure that these chemical manufacturers buy in to the new service, based on the cost-benefit analysis undertaken below, and demonstrate that a new service delivery model that includes additional waste streams will enhance chemical and drum collections, not detract from them. Securing chemical company buy-in is likely to be an issue of careful timing and staging of pilots, with assurances given that the extension of service delivery will not involve cross-subsidisation of existing collection services in favour of new waste streams.

Ultimately, the strategic justification for Agrecovery pursuing this business case is simply that the foundation was founded to address persistent waste issues. The Agrecovery foundation mission is "to enable environmentally sustainable waste management practices for the rural sector through model product stewardship policies". This is the reason why Agrecovery exists and it has rightly recognised that focusing solely on hard plastics and chemicals addresses only part of the problem it was formed to address.

The strategic justification for the involvement of EnviroWaste in this option is, if anything, stronger. With its investment in recycling technology, EnviroWaste must secure large volumes of plastic to ensure these assets are properly utilised and provide a reasonable return to the company.

In addition, since being purchased by Hong Kong based CKI, EnviroWaste has been mandated to ensure that 95% of all recyclables collected in New Zealand are recycled in New Zealand. This option enables EnviroWaste to take significant strides in achieving this goal.

At the highest levels, EnviroWaste is driven to implement new collection services to capture agricultural plastics. It is understood that this new service option is a critical strategic focus for the company and they are strongly committed to securing those plastics that are currently being burned, buried and stored on farms.

While the implementation of this option does provide challenges for both organisations it is apparent that it is 'core business' for both entities and a strong strategic justification for implementation is present.

Market validation

Of all the options pursued under this project, the services being considered by Agrecovery and EnviroWaste under this option have been those most rigorously tested with potential users, particularly in regard to Temporary Pop-up Recovery Events. Since first creating this concept, a number of surveys have been undertaken with farmers to determine willingness to participate in events and pay to drop off wastes. A recent focus group also discussed events and associated services in detail. A large number of territorial authorities have been engaged and feedback sought on the concept of events and how these might be undertaken.

In all of these activities, the feedback has been overwhelmingly positive. Farmers have shown a strong willingness to be involved and utilise events, and many councils have expressed a desire to be a partner in promoting and executing the events. The project now has a wealth of information and contacts that will enable refinement of the design for events to ensure successful trials.

The validation by the target market for this option is very strong and provides a strong justification to test the concept 'in the wild' through pilot trials.

Overall cost-benefit analysis

The following are considered the key benefits of this option:

- Agrecovery presents the most logical organisation and brand to oversee and coordinate rural waste activities. It is a non-profit organisation with a trust mandate to address rural waste issues, and has a foundation board that comprises representatives from key agricultural organisation stakeholders. For Agrecovery to take further steps into coordinating rural waste activities and becoming a focal brand and point of recognition for farmers in this space would be beneficial to the market and from an environmental perspective.
- The current soft plastics collection service undertaken by Plasback is not optimised in terms of service coordination and rationalisation, nor in terms of service timeliness. Service uptake is limited – though growing – but at least 80% of dairy-related soft plastics are not being recycled.

The entry of a new player into this market, particularly with enhanced service delivery, a range of service options and a strong customer focus, is likely to set a new standard for service quality, resulting in higher levels of service take-up.

- The addition of other waste streams, and in particular soft plastics, to Agrecovery's offering enhances the service offering to customers. The ability to deal with hard and soft plastics concurrently through each of the three channels (events, permanent sites and on-farm collections) offers considerable value to farmers. The fact that Agrecovery as a non-profit is able to sit outside brand loyalties will reduce farmer frustration around brand restrictions. Agrecovery is likely to be the only organisation that can move, over time, towards offering a 'one-stop shop' for rural waste.
- It is probable that the entry of Agrecovery into this market, particularly backed by EnviroWaste, will encourage plastics manufacturers to support a product stewardship scheme. This would provide additional resources for service delivery and further engage agricultural suppliers in product stewardship.
- EnviroWaste has already expressed an intention to pursue soft plastics volumes from agricultural sources, potentially whether or not Agrecovery is involved in service provision. This is driven by EnviroWaste's desire to capture large volumes of plastics to process through its Christchurch-based plastics plant, as well as other plastics processing technology in development. Agrecovery's involvement would provide extremely useful oversight and guidance to such a service.
- EnviroWaste brings with it a nationwide collection network that has enormous capacity and reach. EnviroWaste is able to provide a high level of customer service and cost efficiencies through a variety of collection channels including back-haulage and use of local subcontractors. EnviroWaste has provided indicative pricing for extended services that is both reasonable and significantly below that offered by incumbent service providers.
- Adding additional waste streams into existing collection / drop-off channels will have a low marginal collection cost. In some cases, where trucks are not full, marginal collection costs will be negligible. This means that collection costs can be spread over a wider and greater volume of waste, ultimately reducing the cost of all waste collections, including those currently provided by Agrecovery.
- Both EnviroWaste and Agrecovery stand to make considerable revenue from service provision given its potential scale. It is likely that service provision will be strongly profitable.

The following are considered the primary costs of this option:

- Agrecovery has a positive reputation in the market and is well-regarded by the chemical companies that support it. By extending services into new waste streams, or providing new service pathways, Agrecovery risks this reputation if service delivery is not of the highest quality, carefully managed and ultimately successful.
- Considerable investment has been undertaken by EnviroWaste to be able to recycle plastics under this option. It is likely that more investment will be required to handle contaminated waste once services are launched.
- Promoting and coordinating pop-up events with a range of waste streams will require considerable resources, particularly in order to ensure communities are engaged and farmers are reminded to participate.

- A well-designed event registration system, with supporting promotional and reminder systems, will be required. This is not necessarily an overwhelming cost as the current Agrecovery website has elements of this functionality in place.
- EnviroWaste is investing in new curtain-sider trucks to collect both hard and soft plastics. This is a cost that EnviroWaste has elected to incur under its contract with Agrecovery, however, and will be faced whether this option is pursued or not.

It is clear that pursuing this new option will require considerable resources and reputational risk. The level of strategic alignment from both parties, coupled with the compelling benefits this option provides and the conservative testing process envisaged, suggests that, overall, this option provides strong net benefit to both organisations, to farmers and to the New Zealand rural environment.

Deployment pathway

The clear indication from both Agrecovery and EnviroWaste is that the potential addition of soft plastics to the programme is the first focus. It is likely that, following successful pilots of this element of service delivery in winter of 2017 via on-farm collection, events and/or permanent collection sites at a small number of locations, considerable analysis will be undertaken to determine farmer uptake, satisfaction with service delivery and service profitability.

It is probable that the next phase of service testing would be to extend broader events and collections to new areas in a phased and managed way to minimise risk and build the business case for full roll-out based on accumulated collection data. While a full implementation plan will not be considered until Milestone 5, it is likely initial service testing via pilots would take place between July and September 2017, and then increasing pilot activity would be undertaken over the following year.

It is anticipated that a fully-fledged service under this option could feasibly be in place by Winter/Spring of 2018, based on a roll-out roster for Temporary Pop-up Events, around which on-farm collections would be organised regionally. This will, of course depend both on successful initial piloting and on agreement by both Agrecovery and EnviroWaste to extend service delivery.

These deployment timeframes are considered to be reasonable and appropriate.

4.2.5. Implementation Recommendation

It is obvious that the business model under this option offers a compelling proposition and would, if executed correctly, present the potential to radically change the nature of commercial rural waste management. It is an option that genuinely has the potential to stimulate large-scale behaviour change among farmers based on its levels of convenience and affordability.

The relationship between Agrecovery and EnviroWaste is a new one, however, and time needs to be allowed for this relationship to 'bed in' and for EnviroWaste to establish itself as a core service provider for Agrecovery in its drum and container programme. Considering new waste streams six months prior to the commencement of EnviroWaste's contract with Agrecovery is an extraordinary scenario.

Yet it is this willingness to develop and resource a business model around extended service delivery that demonstrates the innate desire of both Agrecovery and EnviroWaste to capture new waste streams and

improve recycling outcomes for New Zealand farms. The case for both organisations to be involved in this space is overwhelmingly strong, though a number of risks and challenges in doing so must be confronted along the way.

A primary objective of the pilots will be to demonstrate beyond doubt to Agrecovery's board and stakeholders that the extension of Agrecovery services into new waste streams enhances value for both end users and for those stakeholders that have supported Agrecovery's development to date.

This project provides a unique opportunity for Agrecovery and EnviroWaste to access independent support to aid in planning pilot activities and evaluating them objectively to ensure that any new services have a very high chance of succeeding. Both organisations have recognised this opportunity and, despite the time challenges and risks in pursuing pilot trials in the short term with a view to wider implementation, have agreed to pursue this market testing.

This option is therefore determined to be a preferred option under this project, and it is recommended that it be passed to Phase 3 of this project for implementation planning.

4.3. OPTION 2 – PLASBACK PLASTICS COLLECTION

4.3.1. Business Model and Process

The Plasback plastics collection model and process was fully articulated in Milestone 2 of this project. As this model has not changed in the time since this was described, the model and process are not detailed here.

Worth noting, however, are the key strengths and weaknesses of Plasback's current model. Key strengths are seen as:

- Plasback, alongside Agrecovery, is one of only a handful of rural waste collection services operating, and it has done so for over ten years, collecting significant volumes of agricultural plastics. Plasback's pricing regime has remained static during this time period.
- Plasback utilises a network of local rural contractors that are integrated into local communities and understand farming.
- Plasback provides an on-farm collection service; farmers do not need to transport waste themselves.
- Plasback has a relatively high level of brand recognition.

Key weaknesses/challenges for Plasback are seen as:

- Plasback does not have a central customer management system, so customer experience is not routinely monitored. Contractors have significant autonomy in how services are delivered. The lack of this system also means that transportation logistics are not rationalised and collections are reactive only.
- Anecdotal evidence suggests that customer satisfaction is variable, with some customers waiting months for collections. This may be due to the workload of rural contractors, who may be busy themselves at the very time when higher levels of service are required.
- Being owned by Agpac, a plastics manufacturer, Plasback is unlikely to engage other plastics manufacturers in supporting its service.
- Plasback has achieved relatively low collection rates in the dairy sector.
- Plasback is likely to face stiff competition from Agrecovery / EnviroWaste in the coming months and years and will struggle to compete against a cheaper service with a stronger focus on short turnaround times.

As noted in Section 3.3, despite a number of meetings between Agrecovery and Plasback, no pathway has yet been identified that would facilitate joint service delivery between these two brands and EnviroWaste. Ultimately, for Plasback to work with Agrecovery the brand would really need to be surrendered to encourage other plastics manufacturers to be engaged and develop a broader service. Currently, and understandably, Plasback has expressed unwillingness to see the brand that it has built over a decade be lost. Such a notion would need to be ratified by Agpac's board, which is not seen as imminently likely.

Even if a co-operative basis for service delivery was found, it is likely that Agrecovery would require a higher level of service delivery from Plasback's rural contractor network, at a potentially lower cost. It is not probable that this arrangement would be viewed as acceptable by Plasback or its collection network.

Given the imminent competition that Plasback will likely face, and the weaknesses in its business model, there is some uncertainty over Plasback's future service delivery. As a product stewardship scheme, there is a strong desire to see the service continue, but this cannot be at the expense of the aims of this project, namely, to see more farmers embrace alternatives to burning, burying and bulk storing waste.

Based on this information, the overall feasibility of the business model for the Plasback Plastics Collection option is considered **LOW**.

It should be noted that this rating does not suggest that Plasback is fundamentally unfeasible as a business, but rather that its ability to grow and meet the nationwide objectives of this project based on the current business model is considered to be low.

4.3.2. Review of Supply Chain, Financial Models and Risk Profile

Supply Chain

The overall supply chain for the Plasback Plastics Collection option may be visualised as follows:

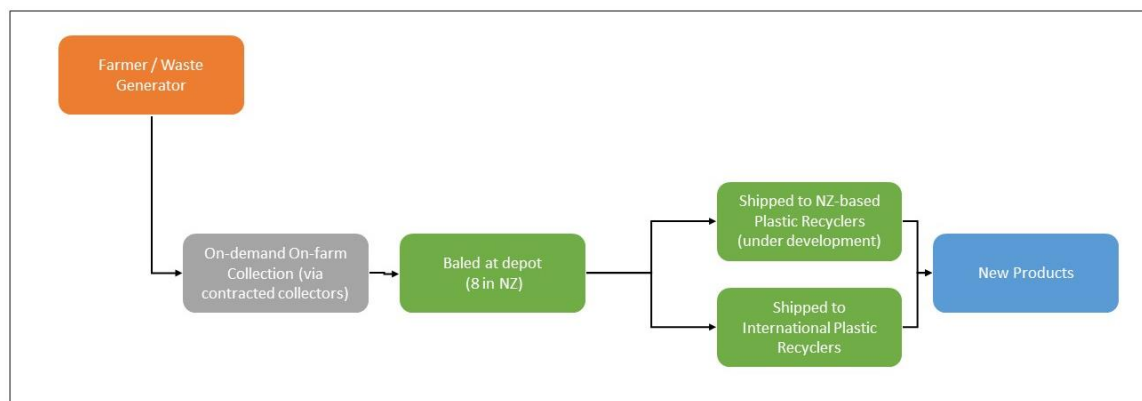


Figure 6: Plasback Plastics Collection Supply Chain

Other than the addition of a trial for processing plastics in New Zealand, the supply chain model for Plasback has not fundamentally change during the Project.

The major concerns around Plasback's supply chain are in relation to its network of contracted collectors. These contractors – some of which cover vast territories – are loyal, but some have reported that the service is not profitable for them. While there are no suggestions that any contractor is intending to cease service delivery, this lack of sustainable profitability of an aspect of the supply chain is a serious concern, and could easily lead to gaps in service delivery.

This situation also likely leads to another concern, being the lack of coordination and supervision of contractors. As Plasback does not centrally monitor customer interactions, the service relies on the contractors responding appropriately and quickly to a customer request, without any evident guidelines as to how and when this should occur. As rural contractors have to fit collections around other activities, and potentially align collections with other transportation movements, securing a timely collection is far from assured for customers.

Thus, the ultimate supply chain issue for Plasback is a lack of control caused by a lack of sustainable profitability in the collection network. This is a substantial vulnerability and there are currently no known plans or strategies from Plasback to remedy this situation.

Currently, this presents as a moderate concern, but the departure of one or more contractors, or the loss of market share, would cause this issue to become severe quite quickly.

Based on this information, the overall feasibility for the reviewed supply chain for the Plasback Plastics Collection option is considered **MODERATE**.

Financial Model

The main concerns around the financial model for this option expressed in Milestone 3 focused on low profitability as reported both by Plasback itself and its contractor network. Concern was also expressed regarding the affordability of Plasback's service to farmers.

These issues are compounded by Plasback reporting that it is feeling upwards pressure on costs, as evidenced by the higher costs charged to provide services in the Gisborne area. Under this programme, Gisborne District Council has provided Plasback with a substantial transportation subsidy to service this more remote region. In addition, liner packs, which normally retail for \$51 + GST, are sold at a rate of \$75 + GST for those accessing services in this area.

While this premium may well be justified in such a difficult to service region, it does suggest that Plasback's financial model is under some stress, particularly in providing services to more remote rural areas.

The ultimate test for Plasback will come if the indicated service delivery prices from Agrecovery / EnviroWaste are made available to the market, offering a one-third saving over the service provided by Plasback based largely on more efficient transportation logistics. Anecdotally, farmers engaged with this project have expressed that they find Plasback to be too expensive, particularly given the timeliness of service delivery. This presents a serious vulnerability for Plasback should competition appear.

Based on this information, the overall feasibility for the reviewed financial model for the Plasback Plastics Collection option is considered **LOW**.

Risk Profile

The following were identified as key risks for this option in Milestone 3:

- Revenue may be negatively impacted by competition (**High risk**).
- Upward pressure on service costs is being experienced (**High risk**).
- Waste volumes may reduce (**High risk**).
- Farmer uptake may be impacted by competition and levels of service (**Moderate risk**).
- The business model may not be profitable (**Moderate risk**).
- Better service management systems are required (**Moderate risk**).
- Foreign exchange fluctuations may impact profitability (**Moderate risk**).

- Transportation costs are proving difficult to manage (*Moderate risk*).
- Service provision may not be profitable for contractors (*Moderate risk*).
- Output market may be threatened (*Moderate risk*).

During Milestone 4, these risks have been explored with Plasback, and this has stimulated discussions with Agrecovery and EnviroWaste to better understand the opportunities for working together or subcontracting. As yet, no such opportunities have been realised.

A specification for a customer management system was also prepared under the Project for Plasback in Milestone 3. This was considered a key strategy which could help prepare Plasback for a competitive environment and also improve service delivery and customer satisfaction. While Plasback agrees that such a system is important, no plans have yet been made to pursue implementation. Plasback has suggested that government funding would, in all likelihood, be required to build and deploy such a system and that accessing capital internally is unlikely.

Ultimately, the risk profile for Plasback has only become more concerning during this milestone as Agrecovery and EnviroWaste have begun to explore soft plastics service delivery.

Based on this information, the overall feasibility for the reviewed risk profile for the Plasback Plastics Collection option is considered **HIGH**.

4.3.3. Final Feasibility Assessment

The following feasibility and risk assessment results have been concluded regarding the current state of the Plasback Plastics Collection option:

Category	Assessment/ Feasibility
Business Model	LOW
Supply Chain	MODERATE
Financial Model	LOW
Risk Profile	HIGH

The feasibility assessment undertaken for Plasback has focused on the strength of its business model and how vulnerable it is likely to be to new entrants to the market. If no other service provider enters the soft plastics space, there is every chance that Plasback will continue to operate successfully, subject to its ability to maintain pricing and service levels. Yet it is considered highly likely that soft plastics will become a competitive space and it is difficult to see how Plasback will continue to thrive in this environment, likely surrendering market share and potentially reaching a state in which continued operation becomes unfeasible.

Based on this information, the overall reviewed feasibility for the Plasback Plastics Collection option is considered **LOW**.

As feasibility is considered to be low, and Plasback is already operational, no business case has been prepared for Plasback involvement in later stages of this project and the Plasback Plastics Collection option is not considered a preferred option under this project.

4.4. OPTION 3 – COMMUNITY ORGANISATION ON-FARM COLLECTION

4.4.1. Business Model and Process

As this option does not refer to a single organisation, there is no one unifying business model that describes how services would be provided under this option. The business models for the small number of community organisations that are currently providing rural waste collections were included with Milestone 3 and are not repeated here.

There are a number of key elements to the inherent nature of a community organisation service, however, that are common and important in assessing this option:

- The community mandate of these organisations means they are often willing to pursue marginal business models based on altruistic objectives.
- Community organisations are very strong in community engagement. In practice, this means that such organisations are likely to have an edge in encouraging farmers to make full utilisation of services and work to minimise contamination. Wastebusters Canterbury's service model demonstrates their ability to provide on-farm education and ensure services are well utilised. This provides opportunities for stronger revenue and lower costs of operation.
- As non-competitive entities, community organisations are able to 'wrap around' existing service provision to fill gaps in service delivery. Flexibility and adaptability are typically strong among these organisations.
- Community organisations, while not having ready access to capital, are often able to tap into public and private funding mechanisms where a compelling business case is presented.

Although business models will vary, in all likelihood a community organisation providing rural waste collection services will do so from a community resource centre base, with a focus on collecting recyclables that can be processed or sorted on site. It is unlikely that the organisation will have access to a vehicle fleet, so a local rural transportation company will be contracted to undertake collections, perhaps taking advantage of backhaulage. Wastebusters Canterbury notes that the partnership between themselves and the transportation company they use has been critical to their success based on affordability and reliability. This is an important element in the overall model.

Customers are likely to be engaged with domestic recyclables initially, or perhaps a small number of priority waste streams such as soft plastics or twine. It is unlikely that hazardous materials or any waste stream handled by Agrecovery is likely to be included unless there are poor levels of local service delivery.

Provision of up-front and ongoing education and engagement is likely to occur and this will ensure that waste streams are sorted appropriately and well prepared for collection. Wastebusters Canterbury has utilised robust but inexpensive wooden crates to store waste on farms prior to collection, which has worked well. Farmers purchase these bins and retain ownership. Other organisations may wish to follow this model, but solutions will likely be based on the ability to source receptacles easily and inexpensively.

Collection services are likely to be more or less on-demand, with some delays to allow for clustering of collections. Ensuring that the majority of customers are within 50kms of the resource centre, as is the case with Wastebusters Canterbury, aids in planning pick-ups. Farmers are likely to pay a fee per bin, with a mileage charge and additional fees for contamination, which community organisations are more able to enforce based on the strength of relationships.

Based on the values of the community organisations providing or considering provision of services for rural waste, extensive efforts will then be made to ensure that wastes are responsibly recycled, and revenue generated to support operations.

While no definitive assessment can be made of an overarching business model, Wastebusters Canterbury (which has greatly influenced other similar community organisations) has shown that its business model is innovative, successful and sustainable, if not highly profitable. Regional variations are expected and may make other business models more or less effective, but this generic approach is used as a basis for considering how community organisations might provide services into rural communities.

Based on this information, the overall feasibility of the business model for the Community Organisation On-Farm Collection option is considered **MODERATE**.

4.4.2. Review of Supply Chain, Financial Models and Risk Profile

Supply Chain

Again, as with an overall business model, there is no single supply chain that covers this option and there will be significant regional variation. Community organisations do, however, follow a fairly similar pattern as to how they operate and are likely to bear some similarity to the generic supply chain for the Community Organisation On-Farm Collection option visualised as follows:

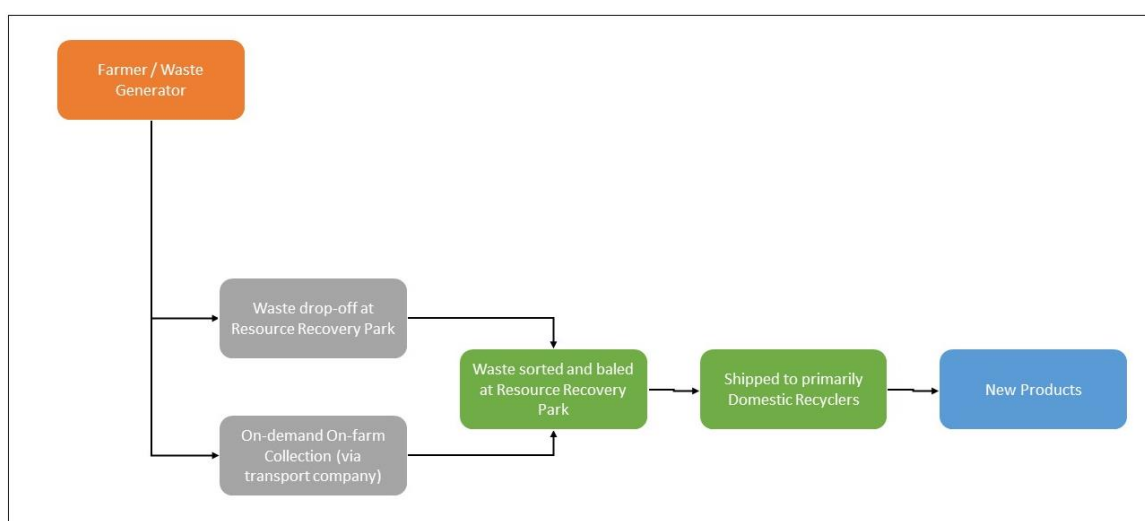


Figure 7: Community Organisation On-Farm Collection Supply Chain

As previously noted, this supply chain model requires strong engagement and management of the logistics company undertaking the collections. Failure to monitor collection timeframes and customer experience may result in rapid loss of business. Fortunately, there are understood to be an abundant supply of rural trucking companies operating throughout New Zealand that are capable of filling this role.

Another important aspect of the supply chain, and a key challenge for organisations looking to operate in this area is the pre-processing operation. Wastebusters Canterbury has advised the need for a baler and forklift as necessary assets for rural waste processing. While some organisations may already have such equipment for operation of recycling facilities, the need to secure such expensive assets may quickly derail plans for service provision.

Another challenge in ensuring an efficient supply chain is, of course, ensuring a steady supply of waste. Services of the kind provided by community organisations are likely to grow organically over time based on customer referrals. Marketing budgets are likely to be very limited unless partnership with local councils can boost these efforts. This is a useful model to allow bedding in of the supply chain but may make cashflow an issue and low volumes may increase collection costs and decrease available markets for recyclables.

Based on this information, the overall feasibility for the reviewed supply chain for the Community Organisation On-Farm Collection option is considered **MODERATE**.

Financial Model

The main concerns around the financial model for this option expressed in Milestone 3 focused on limited access to capital for service start-up and a likely requirement on government funding. Profitability is also a serious concern based on the financial performance of community organisations already providing services. Geographical reach and scalability of services are also, clearly, limited.

It is a virtual certainty that a community organisation which provides on-farm collection services to rural communities is going to struggle financially. Wastebusters Canterbury have been providing services for some time and only now feel that they have the potential to be sustainably profitable. While such a service, if extremely well-run can indeed provide a positive return, the assets that are likely to need to be acquired to undertake service provision mean returns are likely to be in the long term.

The question will instead be: does the community value generated by this service provision justify the costs and risks associated in developing the service? Based on the feedback from community organisations involved in the recent forum hosted by the project in Christchurch, the answer is an initial 'yes'. There is a strong shared view that commercial rural waste is a serious issue and worthy of these organisations' attention and resources.

While the financial returns are likely to be marginal, it is apparent that these organisations are willing to consider service provision regardless.

Based on this information, the overall feasibility for the reviewed financial model for the Community Organisation On-Farm Collection option is considered **MODERATE**.

Risk Profile

The following were identified as key risks for this option in Milestone 3:

- The business model may not be profitable (**High risk**).
- Providers may not have the required managerial capability (**High risk**).
- Start-up capital may be difficult to access (**High risk**).
- Revenue targets may not be met (**High risk**).
- Initial operating costs may be unacceptably high (**High risk**).
- Required transportation logistics may be hard to economically secure (**High risk**).

- Waste contamination may prove problematic (**High risk**).
- Suppliers may struggle to cope with a range of waste streams (**Moderate risk**).
- Service deployment timeframes may be unacceptably long (**Moderate risk**).
- Service scale-up timeframes may be unacceptably long (**Moderate risk**).
- Waste volumes may be low or inconsistent (**Moderate risk**).
- Farmer uptake may be low (**Moderate risk**).
- Competition may be faced from incumbent providers (**Moderate risk**).
- Providers may not be able to cope with large volumes of waste (**Moderate risk**).
- Technical development timeframes may prove unacceptably long (**Moderate risk**).
- Required health and safety regime may not be in place (**Moderate risk**).
- Waste throughput limitations may cause stockpiling (**Moderate risk**).

The list of substantial risks for this option is long, and has not markedly changed during this milestone. There are high level financial and operational risks inherent in this kind of service delivery that a community organisation may struggle to address satisfactorily. Any community organisation that embarks on service delivery will need to develop a business plan that addresses these risks before service delivery can be launched.

Based on this information, the overall feasibility for the reviewed risk profile for the Community Organisation On-Farm Collection option is considered **HIGH**.

4.4.3. Final Feasibility Assessment

The following feasibility and risk assessment results have been concluded regarding the current state of the Community Organisation On-Farm Collection option:

Category	Assessment/ Feasibility
Business Model	MODERATE
Supply Chain	MODERATE
Financial Model	MODERATE
Risk Profile	HIGH

This option is somewhat difficult to assess in that it represents a category of providers rather than a single organisation, and a business model template, rather than a specific, defined operation. The assessment is undertaken based on the broad potential of community organisations to operate sustainable collection services and to contribute to the overall aims of the Project.

In that regard, this option definitely has promise. It is high risk and would not be easy for any of the organisations concerned, but Wastebusters Canterbury has shown that there is a market niche for these kinds of services and a gap where more intensive service delivery can fit. The level of service and education provided by community organisations not only ensures that waste is correctly handled and recycled, but that customers are more likely to promote the services to others, as Wastebusters Canterbury has discovered.

Successful service delivery will require careful planning and funding to ensure that everything is in place before services are launched. A number of organisations have also sought assistance in this planning, which it is intended this project can provide. With support and a well-formed strategy, community organisations have every chance of creating strong business models and fulfilling a strategic role in the aims of the Project.

Based on this information, the overall reviewed feasibility for the Community Organisation On-Farm Collection option is considered **MODERATE**.

4.4.4. Business Case for Implementation

Strategic justification

Canterbury Wastebusters has a mission to divert “waste from the landfill by the means of Reducing, Reusing and Recycling and working towards the ultimate goal of Zero Waste”. The Seagull Centre has a mission to “educate and empower the community to achieve its potential for reducing waste”. The Helensville Community Recycling Centre “is committed to reducing landfill & working towards zero waste”.

The mission statements and strategic goals of the organisations considered under this option are remarkably similar; they are focusing on addressing waste in their communities and promoting recycling. Given the rural communities in which most of the engaged organisations are based it is inevitable that commercial rural waste will eventually attract attention. The prevalence of burning, burial and bulk-storage of waste in rural communities is an expressed concern to these organisations and so commercial rural waste is a strategic priority.

Market validation

The level of market validation that may be applied to this option will depend on the exact waste streams chosen and the way in which it is collected. Despite this, the best reference point for market response under this option is the track record of Wastebusters Canterbury.

Having worked diligently to establish itself, Wastebusters Canterbury has seen customer uptake increase incrementally and they now have in excess of 100 regular customers for on-farm collection, with very low rates of contamination based on their customer engagement process. Their service growth has not been based on marketing efforts, but rather on the recommendations made from one farmer to another. Furthermore, not one customer that has commenced the service since its inception has stopped using it, even though dairy payouts dipped last year to historic lows.

The flexibility and hands-on approach to service delivery that Wastebusters Canterbury takes clearly appeals to its customer base. Where a customer has a request or perhaps wants to do something “a little differently” the response is likely to be one of openness and a willingness to make the service work for the customer. This is another important aspect of this type of community-oriented service.

While Wastebusters Canterbury reports that many customers initially baulk at the cost of service provision, their community status affords a transparency and credibility in explaining the costs framework to customers. Wastebusters Canterbury reports that it is unusual for customers not to accept this once they understand it.

Should other community organisations follow Wastebusters Canterbury's lead, they might reasonably expect a positive market response.

Overall cost-benefit analysis

The following are considered the key benefits of this option:

- An on-farm collection service is provided to farmers based on a broad range of waste streams at a relatively affordable price.
- The aims of community organisations in reducing waste to landfill may be dramatically advanced.
- Wastes are handled by a credible community organisation with a focus on effective recycling or upcycling.
- Farmers are effectively engaged and educated to reduce contamination and achieve buy-in and a higher level of awareness around rural wastes.
- Service delivery is more able to be flexible and responsive to customer needs.
- Gaps in service delivery for rural waste customers can be effectively filled by a local operator.

The following are considered the primary costs of this option:

- Up-front asset costs may be substantial.
- The inability to provide services profitably may threaten the viability of the organisation or tie up resources that may be used elsewhere.

While this option has considerable risks and costs, it is considered that – if well delivered – there is a strong net benefit for both the community and for the organisation providing services.

Deployment pathway

No certain timeframes for market deployment can be given here, and it is likely that deployment timeframes will be longer than other options given that most organisations are only at the business planning phase. As a short-term solution, this option does not provide considerable value to the Project as each organisation will have to proceed through planning, market validation, approval and fundraising processes before fully engaging with the market and providing services.

As a long-term option to augment wider service delivery options, it is considered that community organisations have a pivotal role to play and that assisting in the development of service to rural customers would pay down-stream dividends in terms of higher levels of farm recycling.

4.4.5. Implementation Recommendation

Following the forum undertaken with community organisations in Christchurch and armed with a greater understanding of Wastebusters Canterbury's business model it is apparent there is an increased appetite to consider on-farm collection services by these community organisations.

With the exception of Wastebusters Canterbury, which is already providing services that actively contribute to the aims of this project, none of the organisations are, as of the time of writing, confirmed as new entrants to the on-farm collection of commercial rural waste streams. Thus, while they present considerable momentum and potential contribution to the aims of this project, they are not yet at the stage where detailed business cases can be prepared.

The depth of service and valuable work that these organisations do in educating farmers about waste and ensuring a flexible service is provided is extremely valuable. While these services will never cover the entire country, their ability to boost what larger providers are doing and fill in gaps in the market is critical and invaluable.

For new community organisations to move into this space will require determination and support, and considerable courage. Funding will not necessarily be easy to come by and patience will be required as markets develop. The best support that the Project can offer is to aid with initial business planning to give these organisations a strong chance of either commencing service delivery on a solid footing, or realising quickly that it is not appropriate for them to move forward at this stage.

It is recommended, and in the interest of the Project's aims, to provide developmental support to these organisations as far as is practicable. Should any of these organisations reach the point, by the conclusion of Milestone 5 of this project, where they are ready to pilot small-scale service delivery it is recommended that they be reconnected to the Project process.

This option is therefore determined to be a preferred option under this project, and it is recommended that it be passed to Phase 3 of this project for implementation planning.

4.5. OPTION 4 – EXPANDED ROSE OIL RECYCLING SCHEME DROP-OFF HUBS

4.5.1. Business Model and Process

The overall business model and process for this option is straightforward and has not fundamentally changed since first conceived. Based on the sustained demand that Fulton Hogan has for waste oil in the South Island, they are prepared to collect reasonable volumes of waste oil from virtually any location. The involvement of Farmlands stores as a convenient location for farmers to drop off waste oil containers provides a point of aggregation for this volume.

With an existing focus on the rural community and a desire to impact rural waste, Farmlands has agreed to trial the provision of 660L wheeled receptacles at two of its stores in Canterbury. The containers, similar to those used by ROSE at Supercheap Auto stores in the South Island, will be locked and the key in possession of Farmlands staff. Customers will be able to dispose of containers of used lubricants by requesting the key from a Farmlands staff member, thus prompting a quick conversation to ensure unacceptable wastes are not dumped, such as antifreeze, solvents, petrol, diesel or vegetable fats. Receptacles will also be printed with information as to what can and cannot be accepted and will be co-branded by ROSE/Fulton Hogan and Farmlands.

The four initial bins for a pilot will be provided to Farmlands by Fulton Hogan at no cost, but it is likely Ministry for the Environment Waste Minimisation Fund support would be sought for a wider roll-out to cover the costs of these bins. Farmlands has 83 stores throughout New Zealand and it is likely that each store would require two bins to manage capacity.

As oil containers are received, Farmlands staff will monitor bin levels and advise Fulton Hogan when a pick-up is required. Fulton Hogan have agreed to undertake this within 48 hours of request, and full volume documentation will be provided on pick-up. Farmlands staff will also advise customers that, if they are in possession of larger quantities of oil, on-farm pick-ups (at no cost) may be arranged directly with Fulton Hogan. All oil collected will be utilised as an alternative fuel source by Fulton Hogan; an activity for which it has an existing resource consent.

Work will begin shortly as a joint exercise between this project, Farmlands and Fulton Hogan to determine a strategy for publicising this service to customers. This will likely include email and print communication with existing Farmlands customers in the areas in which the trials are intended to be held, as well as displays for use within the stores themselves, and informational material for customers. Farmlands may also trial specific promotions for Farmlands cardholders.

For each store that participates either in the trial or any subsequent roll-out, Fulton Hogan will provide staff training and ensure that the bins are conveniently and safely located.

The business model being deployed here has been thoroughly tested in ROSE's relationship with Supercheap Auto, and so it has been demonstrated that it works well and sustainably. The return to Fulton Hogan, in addition to reputational enhancement in supporting a product stewardship scheme for waste oil, is the considerable savings made in fuel costs based on utilisation of the waste oil.

Farmlands are committed to participation based on providing a valuable service to their customers and supporting a national move towards more responsible rural waste management, without direct cost to the company.

Based on this information, the overall feasibility of the business model for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option is considered **HIGH**.

4.5.2. Review of Supply Chain, Financial Models and Risk Profile

Supply Chain

The overall supply chain for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option may be visualised as follows:

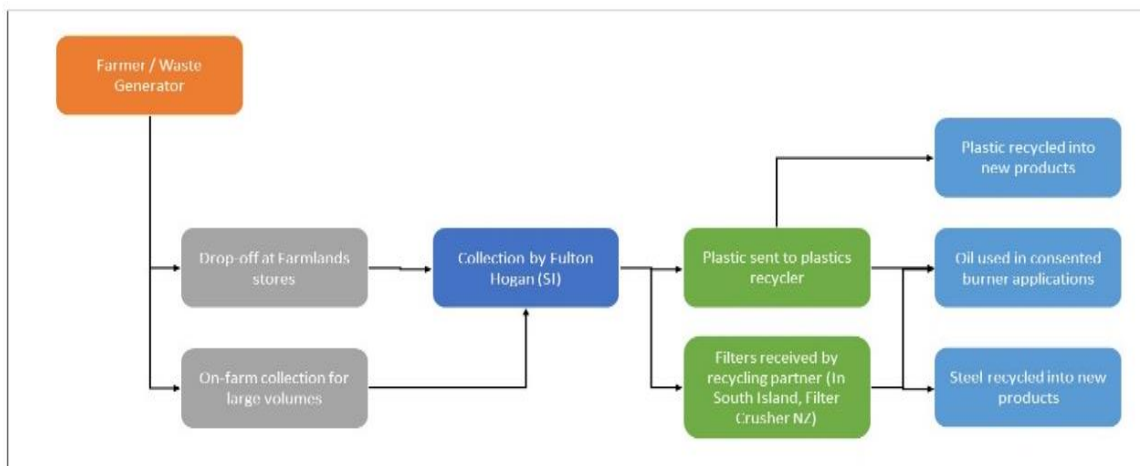


Figure 8: Expanded ROSE Oil Recycling Scheme Drop-Off Hubs Supply Chain

With the confirmation of Farmlands as the front-end partner for this option, the supply chain becomes clearer than the version included in Milestone 3. It should be noted, however, that this supply chain only applies to the South Island, and that discussions with ROSE and its North Island partners would only be initiated based on successful piloting of the service.

The supply chain model shown above includes the option to add in another receptacle for oil filters. This would not be an immediate part of the trial with Farmlands, but this supply chain is in place and Farmlands is apparently amenable to considering such an addition once the pilot is underway, providing an additional waste stream collection point. There are also opportunities to consider the addition of other waste streams, such as vehicle batteries, in due course.

The two key concerns around the supply chain expressed in Milestone 3 were ensuring that farmers do not place unacceptable wastes in the collection receptacle, and the unpredictability of volumes that will be collected.

The first of these issues has been addressed by the padlocking of the collection receptacle at the Farmlands store. This ensures waste is carefully controlled and provides an opportunity for engagement between the Farmlands staff member and the customer. The padlocks used will be universal so that Fulton Hogan can collect and return the receptacles without input from a Farmlands staff member.

The second issue – unpredictable volumes – will be a focus for piloting. Fulton Hogan has identified as potential pilot goals the following:

- The routine equivalent volume of one bin per store per week (2 bins per fortnight) with minimal (<5%) contaminants.
- Ideally, the routine equivalent volume of two bins per store per week (4 bins per fortnight) with zero contaminants.

This goal indicates the level of volume desired by Fulton Hogan to justify the free collection service being offered. While there may be some flexibility in this, particularly if more stores come online and improve collection route density, volumes will need to be monitored closely to ensure feasibility. This will be supported by a strong push to publicise the service among potential users.

Based on this information, the overall feasibility for the reviewed supply chain for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option is considered **HIGH**.

Financial Model

The main concerns around the financial model for this option expressed in Milestone 3 focused on the lack of profitability of the service and its narrowness in terms of waste streams.

Fulton Hogan has not made available the details of its cost savings from utilising waste oil over virgin fuel, but they are understood to be considerable, as indicated by the willingness to undertake waste oil collections at no cost. As no other funds change hands, this is the focus of the financial model: is this cost-saving compelling and sufficient to make the model sustainable?

Clearly Fulton Hogan believes it is, and the overall service provision provides a very low cost profile, so ensuring sustainability revolves around simply ensuring volumes are sufficient. If take-up by farmers is particularly low, then it will not be economic for Fulton Hogan to regularly collect bins. Low volumes will likely result in the asset cost of placing bins at rural stores being unjustified. Ultimately volumes can only be tested by the kind of small-scale, well publicised trial that is intended for Canterbury.

The potential addition of other waste streams, such as oil filters, presents the opportunity to provide a more comprehensive service to farmers and encourage participation, so this may be an element added to a second stage of piloting as a variable to determine impact on participation.

Overall the financial model is sound and sustainable in that it is simply an extension of what ROSE is already doing with Supercheap Autos. The transportation logistics of collection from rural properties will be an additional challenge that will depend on volumes, but the service has the potential to prove popular with farmers.

Based on this information, the overall feasibility for the reviewed financial model for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option is considered **HIGH**.

Risk Profile

The following were identified as key risks for this option in Milestone 3:

- The business model may not be profitable (**High risk**).
- Operating costs may be unacceptably high (**High risk**).

- Transportation logistics to rural locations may prove challenging (**High risk**).
- Likely farmer uptake is not known (**Moderate risk**).
- Development timeframes may be unacceptably long (**Moderate risk**).
- Full-scale rollout timeframes may be unacceptably long (**Moderate risk**).
- A rural store partner has not yet been identified (**Moderate risk**).
- Waste contamination cannot be easily dealt with (**Moderate risk**).
- Health and safety risks may be unacceptable (**Moderate risk**).
- Spillages may cause environmental pollution (**Moderate risk**).

Now that a delivery partner for this option has been identified in Farmlands, a clearer understanding of how the option could work in practice is in place. Fulton Hogan has undertaken to provide training on waste handling, and considerable resources will be enacted to ensure customers know of the service.

The primary risks are essentially singular: if volumes are low, collection costs will be too high. At this stage, this must remain an active risk and will be a focus of piloting activity.

Based on this information, the overall feasibility for the reviewed risk profile for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option is considered **MODERATE**.

4.5.3. Final Feasibility Assessment

The following feasibility and risk assessment results have been concluded regarding the current state of the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option:

Category	Assessment/ Feasibility
Business Model	HIGH
Supply Chain	HIGH
Financial Model	HIGH
Risk Profile	MODERATE

The model under evaluation for rolling out ROSE collection receptacles to Farmlands stores is, in fact, low risk and straightforward. It involves little cost and risk to either participating organisation and can be tested without undue disruption.

Despite this, this option has the potential to offer considerable value both to farmers and to Fulton Hogan by way of increased volumes of waste oil for fuel. Farmlands also has the opportunity to demonstrate commitment to rural waste management and support of a product stewardship scheme without any direct cost being incurred.

Based on this information, the overall reviewed feasibility for the Expanded ROSE Oil Recycling Scheme Drop-Off Hubs option is considered **HIGH**.

4.5.4. Business Case for Implementation

Strategic justification

The Recovering Oil Saves the Environment (ROSE) scheme began in 2010 and was approved as a recognised product stewardship scheme under the Waste Minimisation Act in 2011. ROSE exists for the sole purpose of ensuring that waste oil is appropriately recycled.

Yet, despite the fact that farmers are large consumers of oil through the various vehicles and machinery used on farms, research undertaken in Milestone 2 of this project found that less than 1% of the farmers surveyed had utilised the ROSE scheme. As the scheme currently requires that most waste oil be dropped at auto parts stores, which are found predominantly in larger towns and cities, this is not surprising.

For ROSE, via Fulton Hogan, to venture into the rural sector to extend its collection to waste oil from farmers makes perfect strategic sense. While the logistics of doing so may prove challenging, ROSE has rightly identified that there is potential in tapping into large volumes of waste oil that may not be being recycled.

Farmlands states that its mission is to “enhance the profitability of [its] shareholders through the provision of rural services and supplies”. One of Farmlands’ values is ‘fostering innovation’ by ‘leading and embracing change’ and ‘looking for smarter ways to do things’. As a cooperative that sells lubricants – among many other rural supplies – providing a service of the kind envisioned under this option appears to be a natural fit, as indicated by Farmlands’ enthusiastic participation in development of the business model and early preparations for trialling.

For both Farmlands and ROSE / Fulton Hogan, there is a strong strategic alignment and justification for pursuing this option.

Market validation

During Milestone 3 of this project, a survey was undertaken with a group of farmers asking whether they would be prepared to take waste oil to a rural hub, such as a rural store. 77% of the 105 respondents said they would be ‘somewhat likely’ or ‘very likely’ to participate. Only 12% of respondents said they would be ‘somewhat unlikely’ or ‘very unlikely’ to participate. This was considered a very positive response in terms of the desirability of offering such a service.

In addition, the research undertaken on Temporary Pop-up Recovery Events in preparation for this report found that waste oil and containers was the fourth highest priority waste stream for farmers to take to an event, with only plastics and hazardous wastes rating as higher priorities. It is unlikely that waste oil will be received at events in initial pilots, so this would tend to push drop-off at rural stores forward as the best available option.

It is apparent that farmers are keen to find a recycling outlet for their waste oil. Placing a collection receptacle at a location farmers are already likely to visit with some regularity in a commercial context, is likely to provide a convenient option for waste oil disposal. That the option is now to be provided free, whereas early indications were that a cost might be involved, suggests market uptake may be very positive indeed.

Overall cost-benefit analysis

The following are considered the key benefits of this option:

- Farmers are able to drop off waste oil at a local rural store without cost and in the knowledge that that oil will be responsibly recycled by a nationally recognised product stewardship programme.
- Higher volume users can access a free on-farm collection for waste oil.
- Oil that may currently be disposed of in ways that are harmful to the environment is utilised to avoid the need for virgin fuels.
- Fulton Hogan is able to secure additional volumes of waste oil for fuel and hence reduce operational costs and improve profitability.
- Farmlands is able to better engage and provide value to customers through providing and promoting the service, potentially improving customer loyalty and satisfaction.
- A system and platform is created onto which other waste streams such as oil filters can be added.

The following are considered the primary costs of this option:

- One or two waste receptacles will need to be purchased for each store participating in service delivery. This is a considerable cost given Farmlands' 83 stores around the country.
- Considerable resources and effort will need to be deployed to ensure the service is properly publicised and monitored.
- Fulton Hogan will need to undertake new collection routes to potentially remote locations.

The costs involved in piloting service delivery are minimal and, should customer demand warrant a full national rollout, it is considered that the benefits would considerably outweigh the one-off and operational costs in establishing the service.

Deployment pathway

Moving forward with locating collection receptacles at Farmlands stores and commencing a pilot is likely to be a very short-term activity, with commitment from both Farmlands and Fulton Hogan to proceed with this evaluation. This pilot is likely to produce data within a few months that indicates whether farmers are motivated to utilise the service.

A successful pilot would potentially prompt further store rollouts in the South Island in a phased deployment that ensures collections are manageable for Fulton Hogan. This may take some months to cover Farmlands' 34 South Island stores.

At some point during this initial rollout, ROSE's North Island service delivery agents would need to be engaged to determine how the programme might also be rolled out to farmers there. Overall, it is likely a national service rollout would take a year or more to deploy. This is not an unreasonable timeframe and will help to ensure that the system for supporting collections and promoting the service is well developed and refined.

4.5.5. Implementation Recommendation

There can be little doubt that this option provides significant potential benefit and a strong justification for moving forward with implementation planning and piloting. Very little work needs to be done in terms of the logistics of providing the service, with the focus instead on ensuring that potential customers know about the service and are prompted to take advantage of it.

It is extremely fortunate that both Fulton Hogan and Farmlands are highly engaged and receptive to this option, and are willing to trial it at a small number of Farmlands stores, as well as resourcing promotion of the service. As waste oil is a priority waste stream under this project and this option provides a free solution to farmers, it must be considered a priority initiative.

This option is therefore determined to be a preferred option under this project, and it is recommended that it be passed to Phase 3 of this project for implementation planning.

4.6. OPTION 5 – FONTERRA SHARPS COLLECTION

4.6.1. Business Model and Process

The Fonterra Sharps pilot collection has no business model per se, but is rather a trial project initiated by Fonterra to select one key priority waste stream – and determine if farmers can be successfully engaged to dispose of it more responsibly.

Fonterra has provided small sharps containers to a small number of farmers near Te Awamutu in the North Island. Initial reports suggest that these may take up to two years for the farmers to fill. Fonterra first suggested that these may be received by local veterinary clinics – which is certainly possible – but latter discussions have explored the possibility of farmers being able to drop sharps containers off at a Temporary Pop-up Recovery Event. EnviroWaste has confirmed its ability to receive sharps containers at a cost of about \$6.50 + GST based on getting a full drum-load. Fonterra is currently considering whether or not they would cover this cost directly, or whether this would be a user-pays service to farmers. Likewise, the cost of sharps containers – which is not great – may be covered by Fonterra or may be a user-pays service.

Until it is clear who will actually pay for the containers and collection, it is difficult to assess this option, but given a likely total cost for the service of less than \$20 per year, farmers are unlikely to object even if the service is full user-pays.

Based on this information, the overall feasibility of the business model for the Fonterra Sharps Collection option is considered **HIGH**.

4.6.2. Review of Supply Chain, Financial Models and Risk Profile

Supply Chain

The overall supply chain for the Fonterra Sharps Collection option may be visualised as follows:

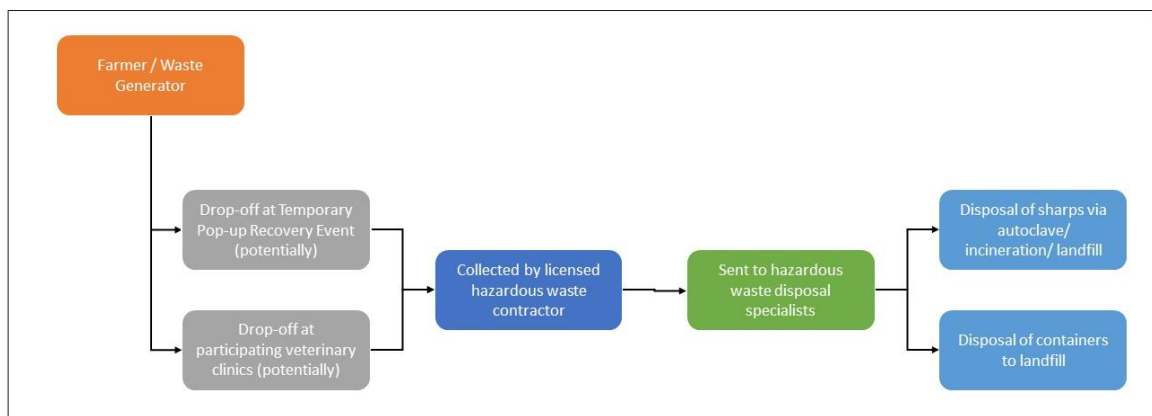


Figure 9: Fonterra Sharps Collection Supply Chain

This option has changed little since its inception, other than the potential addition of drop-off at a Temporary Pop-up Recovery Event. The latter addition does strengthen the supply chain moderately, in that a farmer participating in an event and looking to ‘clear the decks’ of rural waste is likely to take the opportunity to dispose of the container.

The use of veterinary clinics is also a reasonable option, but there is no information as yet from Fonterra as to whether the willingness of such clinics to receive sharps containers from farmers has been tested and validated. Without such a collection pathway, farmers will likely simply store multiple containers, a risk in itself.

In any case, the supply chain is fairly simple and it is likely that disposal of sharps will be able to 'piggy-back' on another waste disposal service.

Based on this information, the overall feasibility for the reviewed supply chain for the Fonterra Sharps Collection option is considered **HIGH**.

Financial Model

The main concerns around the financial model for this option expressed in Milestone 3 focused on the fact that the model was about cost recovery only, with profitability unlikely to feature. A lack of clarity also existed as to who would ultimately pay for containers and disposal.

These issues remain and Fonterra is not yet at a stage with its pilot where definitive answers can be given. However, given the simplicity of the model, these issues do not necessarily cause a fundamental problem for the option. The volume of sharps generated on a farm in a year is very low, such that the containers provided by Fonterra are likely to take 18 – 24 months to fill. Adding an approximate \$10 container cost to a potential \$6.50 + GST disposal cost, equates to potentially less than \$10 a year. Fonterra may decide to cover this cost itself, although this is only likely to be available to its suppliers.

The low costs and complexity of this model mean it is likely to function well and has the potential to be easily adopted by farmers even if they are required to pay for it. Anecdotal evidence suggests that some farmers would, in fact, be grateful just to be able to access such a service.

Based on this information, the overall feasibility for the reviewed financial model for the Fonterra Sharps Collection option is considered **HIGH**.

Risk Profile

The following were identified as key risks for this option in Milestone 3:

- The costs of sharps disposal may be prohibitively expensive (**High risk**).
- Ensuring economic collection of sharps may prove challenging (**Moderate risk**).
- Key aspects of the supply chain are not yet in place or known (**Moderate risk**).
- Farmer uptake may be low (**Moderate risk**).
- Collection of sharps presents a health and safety risk (**Moderate risk**).

The highest-level risks for this option have largely been addressed with a disposal solution price and mechanism having been presented by EnviroWaste. It is likely that the remaining risks will be substantially resolved by the time Fonterra's pilot concludes and before any wider rollout is contemplated.

Based on this information, the overall feasibility for the reviewed risk profile for the Fonterra Sharps Collection option is considered **LOW**.

4.6.3. Final Feasibility Assessment

The following feasibility and risk assessment results have been concluded regarding the current state of the Fonterra Sharps Collection option:

Category	Assessment/ Feasibility
Business Model	HIGH
Supply Chain	HIGH
Financial Model	HIGH
Risk Profile	LOW

The model under this option is remarkably simple and low-cost. While it addresses only a single waste stream, it is a priority one, and one that is a potentially high risk to human health. It is highly likely that Fonterra's pilot will yield positive results and that work can begin on considering how sharps containers and disposal mechanisms might be made available more broadly.

Based on this information, the overall reviewed feasibility for the Fonterra Sharps Collection option is considered **HIGH**.

4.6.4. Business Case for Implementation

Strategic justification

As a farmer-shareholder owned cooperative with a high public profile, Fonterra is under constant scrutiny in terms of its operations and on-farm practices. It is strategically logical for Fonterra to make a small step like this into rural waste to deliver potentially considerable value, even though Fonterra's primary sustainability focus is likely to be on water quality.

As the level of awareness around farm waste issues grows, Fonterra is able to show by supporting this programme that it has begun to develop a proactive approach with a focus on a priority waste stream. While the gesture is modest, successful implementation may provide momentum for further such pilots and services.

Market validation

The ultimate market validation from Fonterra's trial will come in July 2017 when the pilot concludes and Fonterra is able to determine how farmers have utilised the service.

In the interim, as part of the research undertaken during Milestone 3, farmers were asked to comment on the concept of a sharps collection like that being contemplated by Fonterra. 55% of the 105 respondents said they would be 'somewhat likely' or 'very likely' to participate. 22% of respondents said they would be 'somewhat unlikely' or 'very unlikely' to participate.

While this is not an overwhelmingly positive result, half of farmers participating in a service of this kind would be a very positive result, and others may follow in time.

Overall cost-benefit analysis

The following are considered the key benefits of this option:

- Farmers are provided a safe storage container for sharps which can be used over the medium term.
- Sharps are safely disposed of through relatively inexpensive existing and consented channels.

The following are considered the primary costs of this option:

- Fonterra may need to purchase the containers or cover disposal costs based on the results of its pilot trials.

There is a clear net benefit to this option, and its implementation is likely to be subject only to a reasonably positive response from farmers and a confirmed and convenient collection mechanism.

Deployment pathway

At this stage, Fonterra has communicated no indicative timeframe for a wider rollout of this programme based on a successful pilot. As it is, the pilot will run until July 2017 and then be reviewed. The pilot was launched in July 2016 and so will have only run for a year when concluded. Given early indications are that farmers may not have filled containers by the end of the pilot, the opportunities to fully test disposal pathways will be limited and the pilot may be extended, or Fonterra may elect to pay for collection to test these mechanisms.

Beyond this, undertaking a wide service rollout could be undertaken over a matter of weeks or a few months by simply sending the containers to interested farmers. Even if collection mechanisms were not completely established at this time, it is likely that a year or more of lead time would be available before farmers would be seeking to dispose of containers. This would likely leave ample time for veterinary clinics to be engaged or for pop-up events to become established.

4.6.5. Implementation Recommendation

In reality, this option requires very little from the Project in order to run its course. As a Fonterra initiative, a pilot is already well underway. The role of the project in supporting implementation would be to review pilot findings and consider how best to conduct a wider rollout, as well as considering options for cost-effective disposal of the sharps container.

There is little to suggest that this option will not be successful and could potentially become a very easy addition to regular operations on New Zealand farms.

This option is therefore determined to be a preferred option under this project, and it is recommended that it be passed to Phase 3 of this project for implementation planning.

5. CONCLUSIONS AND PHASE GATE JUSTIFICATION

Preferred Options

At the conclusion of Milestone 3, a list of eight options was produced and evaluated in terms of feasibility as follows:

Option	Milestone 2 Feasibility Assessment	Assessments undertaken in Milestone 3				Revised Feasibility Assessment
		Supply Chain Assessment	Life-cycle Assessment	Financial and Operational Assessment	Risk Assessment	
EnviroWaste Plastics Collection and Recycling	VERY HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH
Agrecovery Expanded Waste Stream Collection	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Plasback Plastics Collection	HIGH	MODERATE	HIGH	MODERATE	HIGH	MODERATE
Community Organisation On-Farm Collection	MODERATE	LOW	HIGH	LOW	HIGH	LOW
Expanded Territorial Authority Recycling Drop-Off Hubs	MODERATE	LOW	HIGH	MODERATE	MODERATE	MODERATE
Expanded ROSE Oil Recycling Scheme Drop-Off Hubs	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH
Fonterra Sharps Collection	HIGH	HIGH	HIGH	HIGH	LOW	HIGH
Temporary Pop-up Recovery Events	N/A	MODERATE	HIGH	HIGH	MODERATE	MODERATE

During Milestone 4, the appointment of EnviroWaste as the service delivery contractor for Agrecovery's drum and container programme has resulted in the 'EnviroWaste Plastics Collection and Recycling' option being merged with the 'Agrecovery Expanded Waste Stream Collection' option to give a new option 'Agrecovery / EnviroWaste Rural Waste Services'.

The services being contemplated under this new option also make it apparent that this option encompasses the 'Expanded Territorial Authority Recycling Drop-Off Hubs' option and the 'Temporary Pop-up Recovery Events' option which have also been merged into the option above.

This reduces the options under consideration to five, which have been assessed as follows:

Option	Milestone 3 Feasibility Assessment	Assessments undertaken in Milestone 4				Final Feasibility Assessment
		Business Model Assessment	Supply Chain Assessment	Financial Model Assessment	Risk Assessment	
Agrecovery / EnviroWaste Rural Waste Services	MODERATE - HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Plasback Plastics Collection	MODERATE	LOW	MODERATE	LOW	HIGH	LOW
Community Organisation On-Farm Collection	LOW	MODERATE	MODERATE	MODERATE	HIGH	MODERATE
Expanded ROSE Oil Recycling Scheme Drop-Off Hubs	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH
Fonterra Sharps Collection	HIGH	HIGH	HIGH	HIGH	LOW	HIGH

Of these five options, business cases for implementation have been provided for all but Plasback Plastics Collection, which is currently operational but has elected not to invest in a detailed customer management and transportation logistics rationalisation system – as recommended in Milestone 3- at this time.

In moving forward in this project towards implementation, the following are intended as the focal elements for planning and pilot trials:

- Agrecovery / EnviroWaste Rural Waste Services: Plan, promote and execute a small number of pilot Temporary Pop-up Recovery Events including new waste streams and regional coordination with on-farm collections. Look also at providing soft plastics collection services at Territorial Authority Recycling Drop-Off Hubs and other Agrecovery container collection sites.
- Community Organisation On-Farm Collection: Work closely with specific community organisations to support planning for implementation of on-farm collection services and, where feasible, assist with localised service pilots.
- Expanded ROSE Oil Recycling Scheme Drop-Off Hubs: Plan, promote and execute service provision at two Farmlands stores.
- Fonterra Sharps Collection: Trial collection of sharps containers via a Temporary Pop-up Recovery event and support with planning for wider option rollout.

Phase Gate Justification

Progressing this project beyond Phase 2 requires that preferred options presented have the potential to materially contribute to the outcomes sought for this project, namely:

- Increased recycling, recovery and appropriate disposal of waste streams.
- Reduced environmental impacts.
- Increased industry, local government, community and partner organisations engagement in rural waste minimisation through communicating project learnings and potential waste minimisation options to improve minimisation of rural waste.

It is apparent that the collective impact of the four options being recommended for advancement to Phase 3 is massive. While there is still work to be done on each of these options, private sector businesses, community organisations, industry stakeholders and local government have been successfully engaged to work together on real, practical solutions to provide inexpensive, convenient solutions to operate as alternatives for rural waste to burning, burial and bulk storage of waste.

Each of the organisations involved in this work has invested substantial time and effort to working on business models that could stimulate behaviour change and produce services that become 'standard options' for New Zealand farmers. The requirement now is to move forward and prove the concepts contained in this report by figuring out how best to implement new services and pursuing pilot trials.

It is recommended that this project continues into the Implementation Phase based on the momentum created behind four strong and feasible options and the potential these offer to improve commercial rural waste management behaviour. It is apparent in seeking feedback from the farming community that there is a strong level of motivation to give these services a chance and an openness to embrace new ways of handling rural waste.

This presents a golden opportunity for change.

6. APPENDICES

6.1. APPENDIX 1 – FARMER TEMPORARY POP-UP RECOVERY EVENTS SURVEY

The following survey was issued to gauge farmer interest in the new Temporary Pop-up Recovery Events option identified during Milestone 3. The survey was made available to those participants in the Farmer Survey undertaken in Milestone 2 that notified their email addresses and expressed a willingness to be contacted for further input. 74 responses were received from 35 different districts. Approximately 50% of respondents were from the dairy industry, 40% from beef and/or sheep, 10% from arable farms, 4% from deer farms and 15% from other farm types. Many respondents represent more than one farm type.

Temporary Pop-up Recovery Events

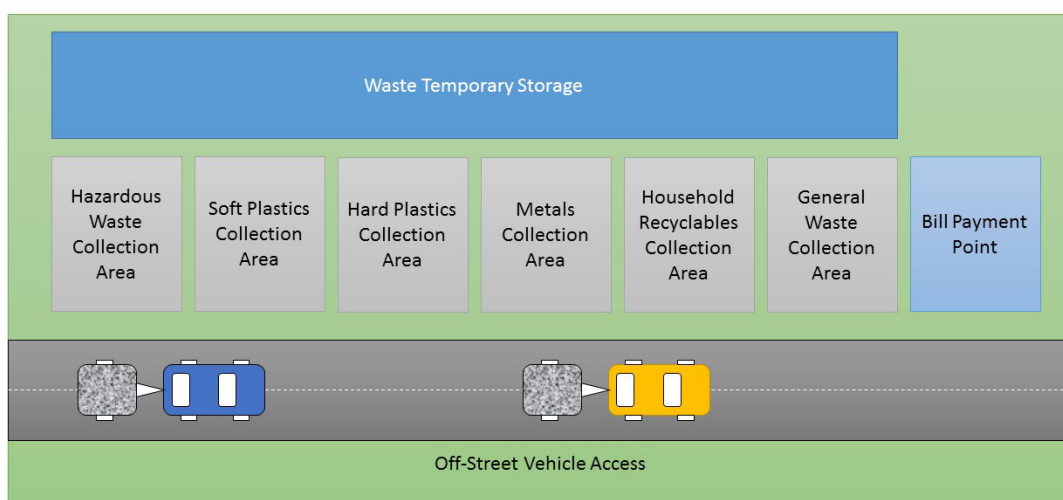
Temporary 'Pop-up' Recovery Events is a new strategy being developed for this project based on feedback from key stakeholders and opportunities that exist to collect rural waste in a more cost-effective and convenient manner. The overall vision for these events is to hold a local event for a specific time frame – most likely a day – to which farmers can bring a range of rural wastes and have them dealt with all at once. This is designed to be a convenient 'one-stop-shop' for rural wastes.

The events have the potential to cater to a wide range of rural waste streams, including:

- Hazardous wastes
- Soft plastics (such as silage wrap)
- Hard plastics (such as agrichemical containers)
- Scrap metal and vehicle batteries
- Domestic wastes and recycling

It is intended that existing providers such as Agrecovery and Plasback are partners in these events and, where they currently charge a collection fee, this would be removed or lowered where waste is brought to an event.

Dropping off waste may look similar to the illustration shown below:



1. *How likely is it that you would take waste to a temporary recovery event, based on the time it would take to get there?*

Driving Time	Very unlikely	Somewhat unlikely	Neutral / unsure	Somewhat likely	Very likely	Total
Less than a 15 minute drive	1.4% 1	1.4% 1	0.0% 0	13.0% 9	84.1% 58	69
15 - 30 minute drive	2.8% 2	12.7% 9	7.0% 5	49.3% 35	28.2% 20	71
30 - 45 minute drive	30.8% 20	10.8% 7	27.7% 18	23.1% 15	7.7% 5	65
45 - 60 minute drive	53.7% 36	25.4% 17	10.4% 7	9.0% 6	1.5% 1	67
60 - 90 minute drive	83.8% 57	7.4% 5	5.9% 4	1.5% 1	1.5% 1	68

2. *How likely is it that you would take the following waste streams to a recovery event?*

Waste Stream	Very unlikely	Somewhat unlikely	Neutral / unsure	Somewhat likely	Very likely	Total
Hazardous wastes (e.g. agrichemicals)	5.6% 2	2.8% 4	7.0% 3	22.5% 12	62.0% 50	71
Soft plastics (e.g. silage wrap)	12.5% 9	2.8% 2	5.6% 4	26.4% 19	52.8% 38	72
Hard plastics (e.g. agrichemical containers)	2.8% 2	5.6% 4	4.2% 3	16.9% 12	70.4% 50	71
Scrap metal	22.2% 16	16.7% 12	13.9% 10	16.7% 12	30.6% 22	72
Vehicle batteries	13.7% 10	11.0% 8	12.3% 9	19.2% 14	43.8% 32	73
Waste oil, oil filters and/or oil containers	9.5% 7	6.8% 5	12.2% 9	23.0% 17	48.6% 36	74
Waste paint	11.1% 8	1.4% 1	13.9% 10	33.3% 24	40.3% 29	72
Household rubbish	39.4% 28	19.7% 14	7.0% 5	14.1% 10	19.7% 14	71
Household recyclables	27.8% 20	9.7% 7	9.7% 7	16.7% 12	36.1% 26	72

3. *How likely is it that you would be willing to pay to drop-off the following waste streams at a recovery event?*

Waste Stream	Very unlikely	Somewhat unlikely	Neutral / unsure	Somewhat likely	Very likely	Total
Hazardous wastes (e.g. agrichemicals)	14.1% 10	12.7% 9	21.1% 15	40.8% 29	11.3% 8	71
Soft plastics (e.g. silage wrap)	27.8% 20	20.8% 15	16.7% 12	26.4% 19	8.3% 6	72
Hard plastics (e.g. agrichemical containers)	31.5% 23	24.7% 18	13.7% 10	23.3% 17	6.8% 5	73
Scrap metal	60.6% 43	15.5% 11	14.1% 10	5.6% 4	4.2% 3	71
Vehicle batteries	45.1% 32	19.7% 14	14.1% 10	15.5% 11	5.6% 4	71
Waste oil, oil filters and/or oil containers	21.9% 16	19.2% 14	27.4% 20	26.0% 19	5.5% 4	73
Waste paint	29.6% 21	23.9% 17	18.3% 13	23.9% 17	4.2% 3	71
Household rubbish	62.9% 44	11.4% 8	8.6% 6	11.4% 8	5.7% 4	70
Household recyclables	66.2% 47	18.3% 13	7.0% 5	2.8% 2	5.6% 4	71

4. *Do you think it would be a good idea to run the events in conjunction with another event such as an A & P Show?*

Yes - align with another event I might go to also	No - leave them as standalone events
18.9% 14	81.0% 60

5. *Do you think it would be a good idea to make the events community-focused, by having information stalls or family attractions such as a sausage sizzle and bouncy castle?*

Yes	No
24.6% 18	75.3% 55

6. *Would you like to see your local district council support or partner in running recovery events?*

Yes	No
97.3% 72	2.7% 2

6.2. APPENDIX 2 – SUPPLIER BUSINESS CASE CORRESPONDENCE

Copies of endorsement letters from key suppliers follow: