



FARM PLASTICS PROJECT

**GREEN-Farms PRODUCT STEWARDSHIP SCHEME
(GPSS)**

COST RECOVERY MODEL GUIDELINES AND
ASSUMPTIONS

21 December 2021

This document should be read in conjunction with the *Farm Plastics Project, GREEN-Farms Product Stewardship Scheme report - Application for Accreditation under the Waste Minimisation Act 2008 – Agrecovery, 21 December 2021*

CONTENTS

1. Background	3
2. Schematic of Cost Model	4
3. Key Principles and Assumptions	5
4. Cost Elements and Cost Assumptions	6
a. Preamble	6
b. Treatment of Key Cost Elements	7
i. Scheme start-up costs	
ii. Working capital requirements	
iii. Forecast volumes and cost recovery fees	
iv. Transition the Agri-chemical into the GPSS	
v. Farm plastics return rates	
vi. Sensitivity analysis	
c. GPSS Collections Costs	11
i. Collection sites	
ii. Collection costs	
iii. Site management and maintenance costs	
iv. Collection site fixed asset costs	
d. Farm Plastics Recovery Hub Sites	17
i. Hub management and administration costs	
ii. Hub transport costs	
iii. Hub cost sharing	
iv. Hub fixed asset costs	
e. Site Management Costs	19
5. Allocation of Costs to each of the Four Plastics Waste Streams	20
6. Risk contingency	21
7. Break down of costs	
8. Asset Replacement	21
9. Cost Recovery Scheme Fees	21
10. Summary of Key Assumptions	23

Appendix A - Additional hub recovery cost information

1. Background

Note the guidelines and assumptions in this report are based the GREEN-Farms Product Stewardship Scheme (GPSS) design and associated cost recovery model ('the model'). A cost model that has been reviewed by Price Water House Coopers (PwC) and was found to be 'fit-for purpose'. A model that provides a robust approach to calculating GPSS costs and cost recovery fees for a regulated and accredited product stewardship scheme.

The Government's focus on plastics has significantly increased over the past year with a renewed effort on reducing the use of plastics and driving plastic recycling efforts. As a result, the Ministry for Environment (MfE) has identified farm plastics as a priority product for which a regulated product stewardship scheme needs to be designed, through the farm plastics project (FPP). It is hoped that such a scheme would significantly lessen the volume of plastics are being burnt, buried or stockpiled on New Zealand farms.

In May 2020, Agrecovery was funded by the MfE to co-design an effective and sustainable product stewardship scheme for farm plastic waste under the Waste Minimisation Act 2008.

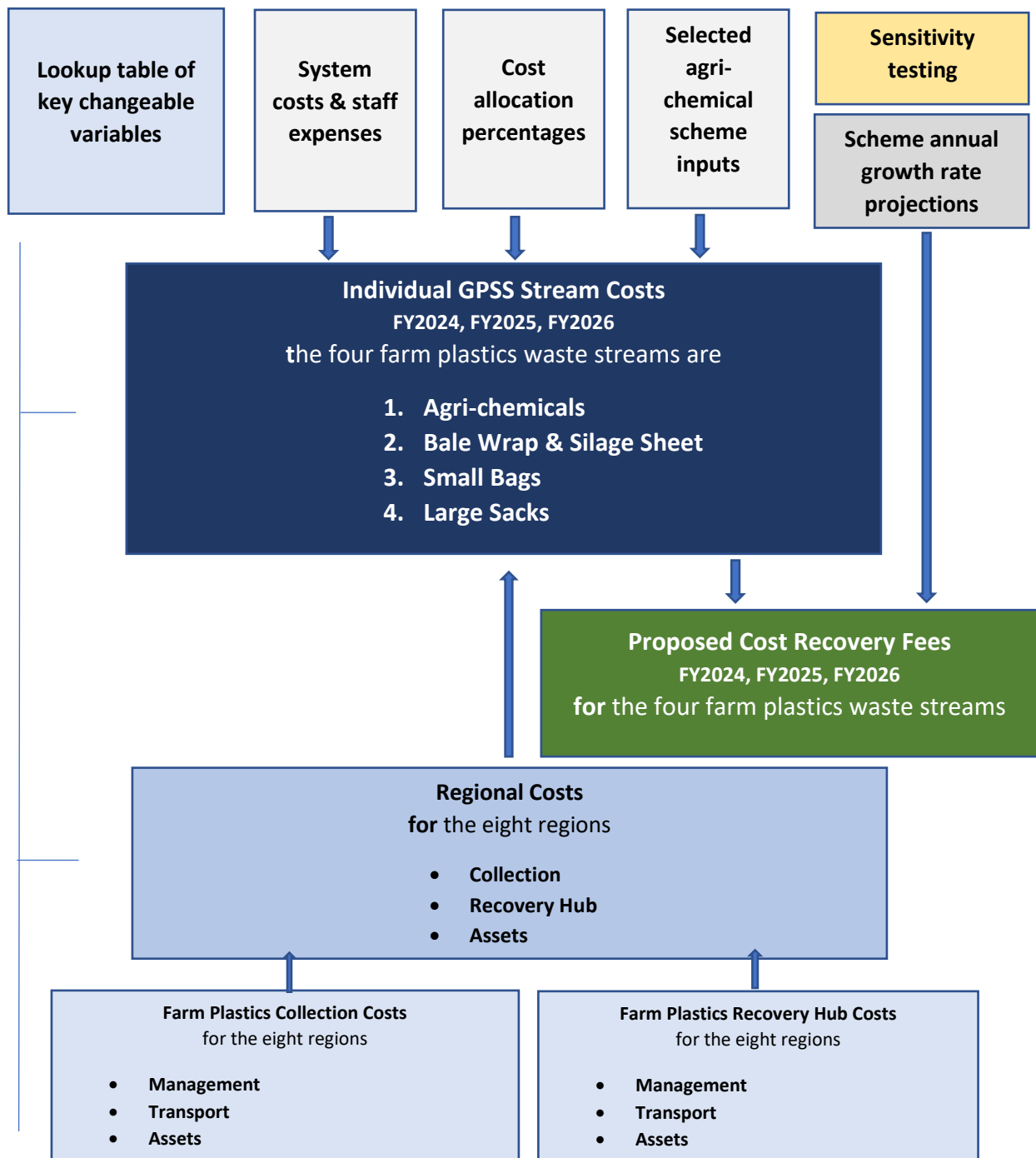
Three new farm plastic waste streams, in addition to the existing agri-chemical scheme have been designed under the banner of the GREEN-Farms product stewardship scheme (GPSS). The four farm plastic waste stream GPSS design has received initial good endorsement from stakeholders and is now being developed for regulation and then accreditation, for implementation commencing financial year (FY2024). This is subject to progressing successfully through the Government's regulatory processes.

The cost recovery model and this document are based on the proposed GPSS scheme design and implementation report dated 21 December 2021 – "GREEN-Farms *Product Stewardship Schemes, Application for Accreditation under the Waste Minimisation Act 2008 – Agrecovery, 21 December 2021*".

The four streams are currently the most voluminous and concerning farm plastics. The advantage of having all four farm plastics streams progressing to the same timeline is that the cost recovery and operational (and delivery) models can be largely combined. The opportunity is to maximise operational coordination benefits and the sharing of costs between and across the farm plastic waste streams.

While the initial phase focuses on the four plastic streams, other plastics may still be recycled off farms, however given complexity, they would not meet the guidelines. Once the four streams are up and running, a review of these other plastics will be undertaken with an aim to add them to the Product Stewardship Scheme.

2. Schematic of the Cost Model



3. GPSS Cost Recovery Model - Key Principles and –assumptions

The cost recovery modelling key principles and assumptions are:

1. The cost recovery model is for the first three years of the farm plastics project (GPSS) commencing FY2024 - regulated cost recovery fees are planned to commence on 1 July 2024
2. The cost recovery will be reviewed by Price Waterhouse Coopers (PwC) to ensure the worksheet is robust and fit for purpose.
3. Fees calculated in the model to be fixed over the first three years FY2024 to FY2026
 - a. regulations are assumed to make provisions for scheme fees to be reviewed annually and adjusted accordingly or more likely to be smoothed (the same) for the first three years of the GPSS and reviewed three-yearly.
 - b. infrastructure (purchase of scheme assets) and startup costs will be incurred in 2023 - discussions with the MfE will be required to identify how these costs will be funded.
 - c. to avoid having to adjust the fees markedly to cover working capital requirements in first few years, some averaging of the fees is suggested – lower fee volatility for fee payers.
4. Working capital has not been included in the model at this time (will be assessed separately).
5. Capital costs such as Infrastructure (asset) and startup costs are shown in the model but are not included in the cost recovery fee calculations as a depreciation/asset replacement cost.
6. Costs cover the service and operational delivery requirements set out in the GPSS design and implementation document dated 21 December 2021.
7. It is expected regulations and scheme fees consultations for the GPSS will be completed in 2023 for accreditation and implementation in FY2024.
8. Operational costs have been broken down into key cost elements – GPSS collections, recovery hub, fixed assets and scheme management (or system costs).
9. Collection, recovery hub and fixed asset (infrastructure) costs have been consolidated for each of the eight identified regions and then apportioned (or allocated) across the four farm plastics waste streams.
10. The volumes and weights of the GPSS farm plastics returned from the farms have been used to apportion stream costs on an equitable basis. The Price Waterhouse Coopers (PwC) report September 2020 commissioned by Agrecovery has been the

basis for stream cost allocations and then tested for reasonableness through wider industry discussions.

11. The growth in plastics volumes has been based on extrapolating the three plastics streams quantified in the PwC 2020 report (2017,2018 & 2019). The extrapolated increases to FY2026 have then been reviewed and a reasonableness test applied using input from industry and other stakeholders. Final assessed annual increases are shown in 'the model' and described more generally later in this paper.
12. Sensitivity analysis has been undertaken by changing the farm plastics growth assumptions, the \$/km transport rate and the number of collection site collection trips.

4. Cost Elements and Cost Assumptions as set out in the Spreadsheet Model ('the Model')

a. Preamble

It is important to note that there are no historical or comparable cost models known to Agrecovery upon which to base the three new farm plastics streams costs on. While the existing agri-chemical scheme has good historical data on operational costs, administration and asset costs, it has only limited applicability in costing out the running of the larger GPSS for the four waste streams.

A cost effective and considered merging of the existing agri-chemical scheme into the new GPSS operating model as another waste stream has been agreed. This should ensure the collection service level to existing agri-chemical scheme farmers and growers is not jeopardized over the first three years of the GPSS.

Given the lack of available cost data, the cost recovery model ('the Model') has been created mostly from first principles. While applying some learnings and understanding of costs from the One Stop Shop collections events held in 2019 and 2020, and engaging with local operators around New Zealand, further piloting or trialing in one region would have helped confirm the accuracy of the cost modelling. A pilot has been promoted but will require some joint funding from stakeholders to operationalize. This pilot is likely to run from mid-2022, with any learnings incorporated into the final operational plan for a national roll-out of the scheme by mid-2024.

Agrecovery will also continue to engage with stakeholders and distributors of these plastic waste streams to set up voluntary collection schemes in the lead up to the GPSS commencement in FY2024.

b. Treatment of key cost elements

i. Scheme start-up costs

Start-up costs have been included in 'the Model' but have not been included in the schemes costs for fee calculation purposes. These costs will be incurred in the years FY2022 and FY2023 pre accreditation as depreciation costs. How these costs will be funded needs to be explored and agreed with the MfE and wider stakeholders.

ii. Working capital requirements

Those who pay the cost recovery fees (the scheme fee payers) will want to see farm plastics collection and treatments being provided as soon as possible after accreditation – planned for July FY2024. To ensure this occurs establishing the GPSS collection and treatments infrastructure will be a priority in year one of the scheme.

Consequently, all scheme infrastructure (asset) and establishment costs in 'the Model' will occur in FY2023 and early FY2024.

The smoothing of cost recovered fees over the first three years may cause some working capital shortfalls in the first year of GPSS. Fee income may not cover the initial costs in the early months of the GPSS.

Agrecovery will look at a more detailed working capital model to assess how costs can be managed while fee revenues accrue to a level that covers GPSS running costs. Loans and/or partial funding could be provided from Agrecovery reserves (if Agrecovery is the scheme manager). Discussions to be had with MfE to agree on how any working capital deficits could be funded in the early part of the GPSS, through a short-term debt facility or other funding mechanism. Landfill levies could also be a source of funding and producers and distributors of farm plastics, as well as other industry bodies, may be willing to support a scheme that benefits the whole industry.

iii. Forecast volumes and cost recovery fees

The quantum of the cost recovery fees each financial year have been calculated in 'the Model' based on a forecast of volumes and individual scheme costs in FY2024, FY2025 and FY2026.

Forecast volumes have been based on, firstly, extrapolating the annual quantities of each of the GPSS four farm plastic waste streams for years 2017, 2018 & 2019 from the PwC volumes report, September 2020. This covers the bale wrap and silage sheet film, small seed, feed and fert bags and large fertiliser and grain sacks farm plastic waste streams.

Secondly, taking the extrapolated PwC volumes and applying a reasonable test based on other sourced information annual growth rates used in 'the Model' have been projected as follows:

- Agrichemical Containers and Drums @ 6% per year
- Bale Wrap and Silage Sheet @ 4% per year
- Small Feed Bags @ 6% per year
- Small Seeds Bags @ 5% per year
- Small Fertiliser Bags @ 0% per year
- Large Fertiliser Sacks @ 3% per year

Discussions with key industry players and other stakeholders highlight a number of factors that will possibly reduce or increase the use of farm plastics over coming years:

- The Fertiliser industry appears to be moving away from using small sacks with a greater focus on large half and one tonne sacks
- There is a push to reduce the use of fertilisers on farms and look to better farming practices to promote grass growth
- Growth in feed bags is likely to continue and possibly increase due to climate change (droughts and floods) and changing farming practices through more indoor farming practices.
- Seed bags growth is likely to continue at current rates
- Growth of 4% in bale wrap and silage sheet volumes will likely slow in coming years, through a combination of changing farming practices

i.e. a reduced focus on dairy farming and a possible move back to more traditional winter-feeding methods and hay making.

- Agri-chemical containers and drums are likely to continue at the current growth rates.

Also, as previously noted is the New Zealand Government's emphasis on reducing the use of single-use plastics and looking for alternative renewable packaging solutions will reduce the use of farm plastic volumes over the medium to longer term.

iv. Transitioning the existing agri-chemical scheme into the GPSS

Agrecovery has decided on a proposed plan to smoothly integrate the existing voluntary accredited agri-chemicals and containers scheme into the GPSS. The collection operation for this waste stream will be merged over the first three years of the scheme and fully integrated by FY2026.

The aim is to ensure existing scheme stakeholders are taken on a considered and measured transition journey. It will also protect the loyalty and goodwill from farmers and growers to the Agrecovery scheme and the investment put into it by stakeholders over the past fifteen years. Most importantly to work with and support the distributors and others who provide the 150+ agri-chemical collection sites currently operating to integrate into the larger scheme.

In addition, Agrecovery are contracted to use the existing two collection trucks until mid FY2024. This cost has been factored into 'the Model'. Further discussions on how these truck mounted shredders might be integrated into the larger scheme will be undertaken as part of the transitioning plan for the agri-chemical scheme.

'The Model' shows the agri-chemical scheme largely running in parallel to the other three schemes for the first three years. It is acknowledged that this brings some inefficiencies as there will be some duplication of costs. Agrecovery will seek agreement from scheme (brand) fee payers on taking this transitional approach from the existing scheme design. By applying the fee matrix originally modelled for a single agrichemical and

container scheme surpluses may occur due to the cost sharing benefits of belonging to the GPSS over the first three years with no material change to the agri-chemical scheme fees. These fees will then be adjusted at the end of the first three years to align with GPSS fees.

v. Farm plastics return rates

At this stage there is limited information on which to predict return rates for three of the GPSS farm plastic waste streams. The existing agri-chemical scheme has good historical information on return rates from 15 years of collecting farm plastics agri-chemical containers (and drums) – where useful these have been used in ‘the Model’. Farmer participation in this scheme has reached over 50% in 2020/21.

Plasback have recently provided updated collection data, indicating 4,000T of bale and silage wrap collected in the past year, and this information has been incorporated into our reports. Although this number will include contaminated plastic that will not be suitable for recycling or export – likely go to landfill.

The scheme is dependent on rapidly increasing farmer and grower participation over the first years of the GPSS. The delivery and operational model, as designed, will have the capacity to meet plastics volumes where 80% of farmers are participating in the GPSS at the end of the first three years.

Another factor impacting on returned volumes is how much has been used within the year of purchase. Agri-chemical containers can be used over a number of years i.e. sheep drenches and are returned some years after the purchase date. On the other-hand bale wrap, silage sheet, small and large fertilizer, and small seed and feed bags and sacks are more likely to be used in the first year of purchase and most could be returned in the same year.

In addition, some farmers and growers will have farm plastics stockpiled or stored on the farms in previous years which could be returned over the first few years of the GPSS. Scheme design costs include the capacity to

collect and recover these additional legacy volumes over the first few years.

It is important to note the designed operating model can be scaled-up if required, to meet additional farm plastic demand e.g. more frequent collection site visits can be made and additional collection bins added, as well as special collection runs built around seasonal capacity and demand.

Please refer to the final GPSS design and implementation report 21 December 2021 for more detail on projected return rates. These rates in 2024 have been used to apportion costs to each of the four farm plastic waste streams.

vi. Sensitivity Analysis

A sensitivity analysis has been undertaken and the results are shown in 'the Model'. It was noted in developing 'the Model' that three factors, if varied, could have a material change on scheme costs and cost recovery fees. These have been sensitivity tested and are:

- \$2.5/km transport cost – the cost to a local transport entity to collect the plastics across a region
- farm plastics growth factors (sales volumes) for all four farm plastic waste streams
- changing the number of pick-up trips to collection sites

The sensitivity modelling indicates that farm plastics growth rates (sales volumes) can have a material impact on the cost recovery fees. The collection site visit frequency and the transport cost changes are much less sensitive to the magnitude of the cost recovery fees, while changing the \$2.5/km transport cost has only a marginal impact on fees.

c. GPSS Collection Costs

i. Collection Sites

The operating and delivery model, as designed in the final GPSS report of 21 December 2021, is based on approximately 145 farm plastics collection sites being established and managed across New Zealand for farmers, growers, and farm contractors to drop-off their GPSS farm plastic waste.

The aim ultimately is to have as many collection sites as possible, where practical, within 25-35km from the majority of New Zealand farms. A farm plastics farmer survey conducted in January 2021 highlighted that the majority of farmers are willing to make the effort, at their expense, to take their plastics, where the weights are manageable, to such a nearby collection (drop-off) site. This approach has worked well for the existing agri-chemical scheme.

Undertaking a desk-top analysis, using Google maps, approximately 145 collection sites have been identified and linked to eight hub regions. Depending on the size and geography of the hub region the number of collection sites vary. These sites are indicatively identified by name in 'the Model'.

In addition, especially for the bale wrap and silage sheet plastics stream where the weights are likely to be significant, a farm visit to collect the GPSS plastics will be offered to the farmer and/or grower by the region's farm plastics collection contractor. The assumption is that many farmers or growers are unlikely to have vehicles that can transport significant weights of this plastic to a near-by collection or hub site – especially for the heavy bale wrap and silage sheet plastics. On-farm collections may also be offered to these farmer and growers in remote areas who are distant from a drop-off site.

These collection (drop-off) sites are likely to be:

First: TA transfer stations,

Second: other existing single plastic, industry or agricultural sites,

Third: new sites required to complete an optimised national network.

Work is underway to obtain information on the willingness of existing single plastic collection site owners to commit to using their optimally located sites. To use them as multiple farm plastic collection site locations and to agree on site management arrangements will continue in 2022 and 2023.

ii. Collection Costs

Travel to collect the plastics from the collection (drop-off) sites – single trip average km's

Using Google Maps the maximum distance from the selected or known regional recovery hub location to the most distant, proposed collection sites in three directions has been calculated – hub locations are described in 'the Model'

The middle distant (or second most distant site from the recovery hub) has been selected for each region. This has been used to calculate the collection km's to be travelled in a region to collect the GPSS plastics from the many drop-of sites on a single round trip.

To fully understand how the regional collections contractor (local transport entity) will go about collecting the plastics within their region is likely to be hugely variable and tailored to local requirements. This variability is likely across all regions based on how full the sites are, how the collection contractors manage their normal day to day work and meeting the required farm plastics scheme frequency of the collections. Consequently, the assumptions used in 'the Model' are on the conservative side in order to cover most collection travel configurations.

Average number of site collections for a single truck trip

The total collection km's per region has been calculated for three scenarios

1. where 5 collection sites can be cleared during a single truck trip,
2. where 3 sites can be cleared,

3. where 2 sites can be cleared.

Without any accurate sound information on farm plastic volumes, a 3-site collection per round trip has been selected. All three have been modelled. This is considered a reasonable assumption based on discussions with a number of stakeholders and the projected volumes at each site.

While limited with data to model and having to make a number of assumptions we believe the design of the scheme will have capacity to enable collection of at least 80% of the volumes sold each year. Five collection trips a year to a collection site by an average capacity truck is anticipated to cope with this volume, while also managing the additional drop-off of legacy plastic.

Number of site collections each year

An average of five collections per year, per site, has been modelled. This allows the total kilometres a truck (with a hoist) is estimated to travel each year in each of the eight regions. The total kilometres travelled will vary across each region and changes can be selected in 'the Model'.

Most farm plastics collections are predicted to occur in early spring. This is when there is likely to be large tonnages of used bale wrap, then large amounts of silage sheet into the late spring and early summer, followed by fertilizer and seed sacks and bags during late spring, over summer and into autumn. Five site collections are expected to cover all the farm plastics volumes throughout the year for the first three years of the scheme(s). These assumptions will be tested in the first year of the scheme and adjustments made as required in later years.

The collection site manager will make a booking when the site is full and needs to be cleared. After the first few years of operation, it will become clear as to how many site visits are required each year and costs can then be refined.

On-farm collections average travel km's

It has been estimated that around 200 farms per region will require a farm visit to collect their plastics (mostly bale wrap and silage sheet) at an average km per farm collection of 250km (round trip).

Again, it is difficult to model the number of farms requiring an on-farm collection or determine the criteria. This needs a detailed farm mapping analysis and understanding of farm plastics volumes per farm. A brief desk-top assessment has been undertaken in one region to get an estimate of the likely number of farms requiring a farm visit. However it is appreciated that the number, size and type of farms and farming practices vary markedly across regions.

These farms could be large farms with large volumes of plastics, or they could be remote farms some distance from a collection site, with lesser amounts of plastics. A round-trip distance average of 250km has been assumed in 'the Model'. This 250km average round trip has been assessed from a desk top mapping exercise which looked at how far remote farms are likely to be, on average, from the regional recovery hub location. Note that these farms will not be within 25-35km from the farm gate where a local drop-off could occur.

Transport cost per km

The cost per km for the collections has been modeled at \$2.50. This per kilometre cost covers the collection contractors operating cost, including overheads and profit. The amount of \$2.50 used in 'the Model' is based on current rates offered to Agrecovery and transport industry information.

iii. Collection Site Management and Maintenance Costs

Our modelling has been based on each collection site being expected to be open for approximately four hours per week for farmers to drop-off their plastics. We are aware that some TA transfer stations and other industry drop-off sites, such as those possibly operated by transport operators, could be open for a number of days per week or every day, which will allow more drop-off flexibility for farmers. Our modelling has allocated the estimated costs of four hours per week to these sites, in

the absence of an accurate estimate of the amount of time these sites are managing farm collections. Those responsible will register the plastics being dropped-off and by whom and these records will provide valuable evidence of individual farmers recycling practices. They will also be responsible for each site being properly maintained and kept tidy and for arranging site clearances.

Collection site management costs have been estimated at \$25 per hour for 4 hours per week plus \$100 per week to provide oversight over the site (security and keeping it tidy) = \$200 over 50 weeks per year. Total annual site maintenance cost = \$10,000 per collection site has been assumed in 'the Model'.

It is assumed a local person could be available to do this work e.g. a retired person or a student, if not integrating these activities into an existing role where the site is currently manned.

Collection contractor costs

The regional collection contractor (likely to be a local transport entity) will be required to carry out a number of activities e.g. to contact farmers who will be offered an on-farm collection and to schedule and make a collection visit and to keep records of what has been collected and from whom. This will be a substantial cost to the contractor.

The contractor is also expected to support the schemes aim of increasing farmer participation through disseminating marketing and promotional information and through word of mouth. They will be ambassadors for the scheme. The model includes a cost of \$50,000 per year for this work.

Collection site cost sharing

It is estimated that at each agreed drop-off site there is expected to be a cost sharing arrangement which could include a contribution to the site owner to manage the site. \$5,000 per site per year has been estimated.

Collection Site Assets

Each site will require collection facilities for multi-farm plastics drop-offs for each of the four farm plastic waste streams – these are likely to be fabricated cages or shipping containers. Three small cages (or bins) required for the agri-chemicals; small sacks and bags; and large sacks schemes; and one large cage or container for the bale wrap and silage sheet scheme. It has been assumed that cages need to be large enough to hold the required plastics on the basis they will be collected (cleared) five times a year. Over the 2022 and 2023 years Agrecovery will be reviewing the collection bin construction and functionality to reduce costs and allow for ease of movement.

The cost of these assets is estimated to be \$4000 for each small cage and \$8,000 for a large container or cage. Transporting the larger shipping containers is expected to cost \$2,000 per site. Total collection site asset cost of \$22,000 (one-off initial cost). These are known costs from cages already being fabricated and used for the existing agri-chemical scheme.

d. Recovery Hub Site Costs

Eight regional recovery hub sites have been identified with early discussions underway with preferred contractors - a carry-over from work conducted in the agrichemical scheme. This does not exclude the use of other plastics recycling operations from contracting these services i.e. Plasback contractors. These sites receive the region's farm plastics collections from the collection contractors and undertake further treatments such as sorting and preparing the plastics for further processing – for export or local recycling. Hub sites will be managed under contract to the GPSS scheme manager.

GPSS recovery hub site locations have been identified for each of the following eight regions. Where possible existing regional operators and infrastructure will be used to support the scheme.

1. Auckland/Northland - Whangarei
2. Bay of Plenty/Thames Valley - Te Puke
3. Waikato/Central North Island - Waipa
4. East Coast North Island - Hastings
5. Wellington/Manawatu/Whanganui/Taranaki - Feilding

6. Marlborough/Nelson/West Coast - Blenheim
7. Canterbury - Methven
8. Southland/Otago – Invercargill

i. Recovery hub management and administration cost

It is estimated that one full time equivalent (FTE) employee (under contract) will be required to manage each of the hub sites for GPSS plastics, given the likely frequency of plastics deliveries throughout the year. This function is important to ensure the plastics are appropriately treated and moved onto export or to a recycler in a timely manner.

This role will be supported by a 0.25 FTE to provide management oversight (under contract), site and facilitate asset maintenance and administration. e.g. documentation, routine asset maintenance, baling straps and the need for additional washing. A baling fee may be required where the baler is owned externally and used on site – added transaction costs.

Each regional hub site cost has been assessed independently as some are being progressed towards a fully functioning hub site.

ii. Recovery hub transport costs

A core element of the hub management functions will be to arrange and facilitate transport of the treated farm plastics to its final destination – to a recycler or to an export facility.

It has been estimated that hub transport costs will be 50 trips a year with an average round trip of 200km x \$2.50/km = \$25,000. There will be regional variability around these costs largely because of the hub location relative to a recycler or exporter/port. A \$2.50 per km transport cost has been assumed as described in the collection costs above.

iii. Hub cost sharing

To cover any shared hub site costs – \$12,000 per year has been estimated for property related costs.

iv. Hub fixed asset costs

Recovery hubs require a range of assets. A mobile hoist (or truck mounted hoist) is required to sort and move the plastics. A baler is required to compress and bundle the plastics for transport. Some hubs will also require washing facilities to ensure the plastics meet the cleanliness standards required for export or recycling.

Work is well advanced with many known hub owners having already acquired infrastructure assets required for the current hub site operations under the agri-chemical scheme – already acquired assets are reflected in ‘the Model’.

Consequently, costs have been assessed on a hub-by-hub basis by Agrecovery staff who have been looking at whether the assets are already acquired, need to be purchased, or can be leased or shared with another asset owner. There are a number of balers within New Zealand and Agrecovery staff have explored opportunities to use these for hub work. Note that each site will likely be different in how the assets are funded i.e. a fully scheme owned baler or paying a baling fee for a locally owned baler. This has been factored into the costs for each region. Farm plastics hub baling asset assessments needed for each region are more fully described in Appendix A.

e. GPSS Management or System Costs

Costs associated with managing and governing the four schemes have been, where possible, informed from the agri-chemical scheme, which has been operating since 2006. These costs are not described in detail in this document and can be referenced in the work undertaken to establish the agri-chemical scheme (used as a guide) - which have been transferred into ‘the Model’. The estimated management costs have been assessed for each farm plastics waste stream in ‘the Model’ taking account of cross scheme coordination and synergies.

The management and governance costs cover but are not limited to:

Scheme manager office & Administration - to provide for an increased workforce and related office costs:

- Management and Governance - including Board secretarial services
- Reference Group support - including travel and accommodation
- Measurement & Standards - important function to record plastics collections and prepare and administer cleanliness and other standards/procedures
- Information Systems - critical communication systems are required to facilitate collections, hub management, contract management, fee management and data collection, monitoring and reporting. Note that Agrecovery has developed a significant database of farmer and grower information which will be of huge benefit to the proposed GPSS
- Marketing and Planning – critical to focus on increasing participation through promotion and marketing and that continuous improvement projects are planned and managed along with business and strategic planning
- Policy, Legal, and Health and Safety - critical functions given the size of the operational and delivery model
- MfE compliance and enforcement functions
- Iwi expertise - to support Management with Iwi engagement and meeting treaty obligations
- Environmental scanning and continuous improvement - important to have internal expertise on farm plastics and the plastics recycling industry and to monitor best practice and promote innovation opportunities.
- Customer Service and Help Desk - a core requirement considering the number of stakeholders and thousands of farmers/growers who will be involved in the GPSS
- Depreciation (asset replacements costs have been used) – over 10 years

The cost to transitioning of the existing agrichemical scheme into the multi-plastics scheme has been estimated at \$200,000 and included in the management costs. This cost could be incurred earlier than 2023/24 and could be recovered when fees commence in later years.

The costs associated with the agri-chemical legacy and orphan product collections and treatment (i.e unused chemicals) have been included in the agrichemical scheme management costs.

From a scheme management perspective the GPSS can leverage-off all the considerable learnings and investments made to establish the agri-chemical voluntary and accredited scheme.

5. Allocation of costs to each farm plastics stream

The allocation of costs to each farm plastic waste stream has been based on the stream's percentage of the estimated total weight of GPSS farm plastics to be returned in 2024. The returned weights for the GPSS farm plastics waste streams have been based on the volumes taken from the Price Waterhouse Coopers (PwC) report September 2020 and extrapolated to FY2024.

The bale wrap and silage sheet stream pick-up the majority of the costs – approximately 68% of the total weight of the projected returned farm plastics in 2024. The other three streams each average around 10%.

The individual stream weights of the farm plastics returned has been used as a good approximation of the effort required to collect the plastics and to recover and treat the GPSS plastics. The effort required to collect bale wrap and silage sheet is significant compared to the other plastics, as it is voluminous and requires bulk handling. In addition most farm collections will be for bale wrap and silage sheet. Apportioning by individual stream weights returned in 2024 and associated effort will ensure there is transparency and equity in the fees being imposed on individual stream producers (or fee payers) – a defensible evidence-based approach.

Stream management costs

Management costs have been estimated on a stream-by-stream basis. Individual stream management or system costs have been estimated with a view to identifying synergies and coordination between and across the streams. The existing agri-chemical scheme costs have been used to guide the individual farm plastic stream management costs where possible. For example, two full-time employees are estimated to be required to operate the scheme manager's helpdesk for all streams, and these costs have been shared equally across each stream.

6. Risk contingency

A 5% risk contingency has been added to cover cost uncertainty within the 'the Model' over the first three years of the GPSS.

7. Asset replacement (in place of depreciation)

The assets have been identified for the collection and recovery hub activities and have been allocated as asset replacement costs over 10 years. This can be changed in the model as required.

8. Breakdown of costs

Costs have been broken down by region and by individual stream in 'the Model'. This has been done to assist with outsourcing the collections and recovery hub activities and to calculate individual stream cost recovery fees.

9. Cost Recovery Fee Calculation - Example

The cost outputs from 'the Model' are used to calculate individual scheme fees. Using the total individual scheme costs and estimated volume and/or tonnage information for the FY2024, FY2025, FY2026 years.

Note that the fees have been calculated based on the annual scheme costs over the three-year period.

Example of how the cost recovery fees have been calculated for the Small Sacks and Bags stream in 2024

Stream	FY2024
Per unit	\$
Seed Bags	0.18
Feed Bags	0.18
Fertiliser Bags	0.18

- 1 Projected volumes of small seed, feed and fertilizer bags sold in 2024 = 9,994,854 units
- 2 Small bags/sacks stream costs in 2024 estimated = \$1,828,615 – note the stream costs have been adjusted based on the apportioning of total scheme costs (collections and hub recovery) across each of the four farm plastic

waste streams. Apportioned based on the returned plastics waste for each stream.

- 3 The small bags/sacks stream fee equates to 18 cents per bag/sack – required to recover the stream costs

10. Summary of Key Assumptions

1. A three-year cost recovery model commencing FY2024.
2. Costs cover the service and operational delivery requirements set out in the GPSS design report dated 21 December 2021.
3. infrastructure (purchase of scheme assets) and startup costs will be incurred in 2023 - discussions with the MfE will be required to identify how these costs will be funded.
4. Working capital has not been included in the model at this time (to be assessed separately).
5. Capital costs such as Infrastructure (asset) and startup costs are shown in the model but are not included in the cost recovery fee calculations. Treated as an asset replacement cost.
6. The volumes and weights of the GPSS farm plastics returned from the farms have been used to apportion stream costs on an equitable basis using PwC data - report September 2020.
7. The growth in plastics volumes has been based on extrapolating the three plastics streams quantified in the PwC 2020 report (2017,2018 & 2019).
8. Sensitivity analysis has been undertaken by changing the farm plastics growth assumptions, the \$/km transport rate and the number of collection site collection trips.
9. Transport cost of \$2.50/km has been used to calculate transport costs for collections and hub recovery transport activity.
10. Forecast volumes and return rates are based on the PwC report data as a basis for calculating scheme costs and cost recovery fees.
11. A nation-wide network of approximately 145 collection or drop-off sites will be required with costs estimated to cover the transport, management and assets required for each site
12. Eight regional hub recovery sites are proposed to collect and treat the farm plastics and they have been estimated based on some historical Agrecovery and information on the required management, processes, transport and assets needed.
13. A 5% risk contingency has been applied to cover cost uncertainties over the first three years

14. Contractual arrangements will be put in place to manage collections and hub recovery functions and activities.
15. Management and system costs have been based on providing operating excellence and adequately resourced across a number of functions with board of trustee a reference group support.

Appendix A (Additional hub recovery cost information) Richard Carroll Agrecovery)

Background to costing for baling services at the eight identified regional hubs

The Model showing cost modelling for the four farm plastics waste streams has applied baling infrastructure and operating costs on a site-by-site basis commensurate with Agrecovery's knowledge of current costs for these services from a number of the identified sites, which already undertake work for us in this area. A brief outline of current or anticipated facilities and operating arrangements is provided below.

While this worksheet costings have been modelled around the use of these current facilities, this should not be read as endorsing these contractors as preferred suppliers and a competitive tender process will be undertaken to appoint operators for each hub. However consideration will need to be given as to the most appropriate locations and sites where existing infrastructure is in place, to ensure the most optimal use of recycling equipment already invested in.

The Model has also allocated national tonnage collection estimates to these regional hubs on the basis of the weightings shown against each regional site in column A. The total volume can be changed and the worksheet will recalculate the baling costs allocated to each hub.

Canterbury

Agrecovery has identified a site in Methven as its regional hub for the Canterbury region. Funding for a baler and telehandler for this site has already been obtained and the site has dedicated space and containers and cages to hold the farm plastic waste streams to be delivered to site. We are currently negotiating a Service Level Agreement with Molloys, which should provide a more accurate assessment of its yearly operating costs.

Scarlett 80 Compactor estimated average bale weight = 450 kgs

Southland/Otago

Agrecovery trialed an optimal site using in Invercargill as a receival point for farm plastics that we collected in that region. A good operation that Agrecovery are keen to support, and we are currently in discussions on partnering with them in the region to collect and process the four plastic waste streams we have identified. Costings reflect current pricing for their services, with the recycled plastic SDE's to trade.

Average bale weight estimated to be c.450 kgs

Marlborough/Nelson/West Coast

Agrecovery has been partnering with Metallic Sweeping in Marlborough to run trial collections and also clear our network of collection shipping containers in this region. They currently run a recycling/re-use facility in Blenheim and bale product collected on Agrecovery's behalf in the region, so we envisage them being a natural partner to undertake this work.

Metallics average c.450kgs per bale

Wellington/Manawatu/Whanganui/Taranaki

We envisage this being a green-field site based in Fielding, this initially being a good geographical site for this broad region. With Taranaki being a strong dairy region, it may support its own regional hub facility at some future stage.

North Island East Coast

Agrecovery works with an entity in the Hawkes Bay region, to manage most of our collections. They currently store product on their site and have baling and allied facilities already on site. The local operators are also strong environmentalists, supporting the work Agrecovery does. We would look to contract out the scheme's baling operations to them for this region.

Bin Hire average c.300 kgs per bale

Waikato / Central NI

Another green field site, with Tokoroa in the centre of the North Island identified as the probable site for a regional hub.

Bay of Plenty/Thames Valley

With a big horticultural industry in the region Agrecovery already collects a considerable amount of farm plastic waste in the Bay of Plenty and has partnered up with a local operator in Te Puke to manage some of these collections. Agrecovery has already pressed ahead with developing this site, with the Ministry jointly providing funding for additional equipment so the site can handle the collection and baling of all four plastic waste streams. Negotiations still to be had on sharing the use of the baler currently on site, with the possible need for further investment to manage run-offs and H&S issues.

Auckland/Northland

Whangarei has been identified as the probable regional site for the hub. With throughput likely to lower than most of the other regional hubs identified the optimal solution would be to partner with a complimentary recycler/baler operating in Northland. However, the attached costings are based on creating a new green field site.