MorrisonLow

poriruacity

Construction and Demolition Waste Minimisation

Report 5 – Financial Viability

Comprising reports 5a and 5b

June 2021

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1 Context

Porirua City Council (PCC), and its partners (Kainga Ora, Hutt City Council (HCC) and Kapiti Coast District Council (KCDC)) are seeking to put forward a business case to utilise, repurpose and sell resources arising from construction and demolition activities in the region. To inform the business case, seven reports have been commission (Figure 1), ultimately culminating in one consolidated report (Report 8).

This is Report 5 – Financial Viability and is comprised of two reports 5a and 5b which together complete the financial feasibility review of the three scale models small, medium and large as defined in Report 3 – Business Model.

The primary feature of this report is contained within Appendix 1 – Financial Model "The Model" (provided in excel format). The Model draws from the key findings of Reports 1, 2, 3, 4 and 6 to generate the assumptions required. The Model has also been updated to reflect the finding of the peer review undertaken as Report 5b. This final version reflects updates since the draft version 4 June 2021.

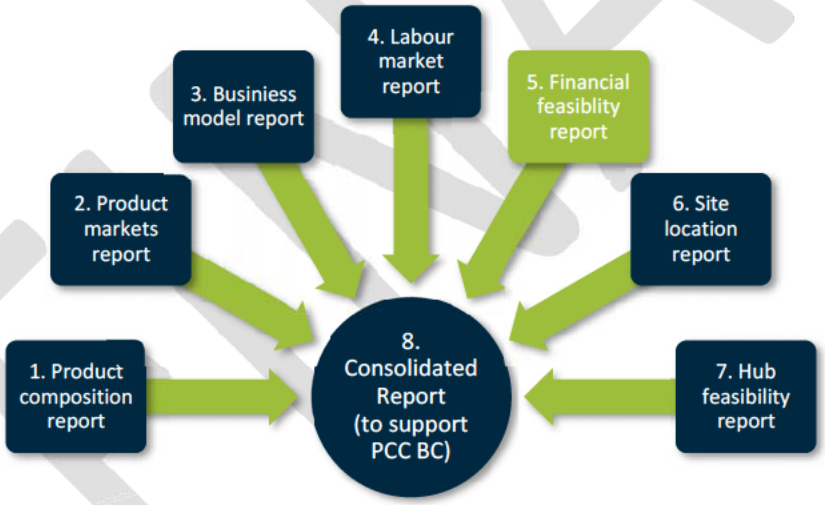

Figure 1 Report structure to inform the business case

Report 5a - Financial viability

1 Overview

The following sections of Report 5a provide an overview of the outputs from comparison of the three operating scales (small, medium, large) using our financial cashflow model, including consideration of sensitivity to market availability.

2 Key assumptions

The financial results presented in this report are based on several key modelling assumptions, which are outlined below and within the financial model itself. Below is a list of global assumptions which apply under all of the scenarios that have been modelled. We have also included, in Appendix 2, a list of assumptions which differ between scenarios.

- We have not considered any non-financial benefits or any non-cash benefits or costs.
- As we have only considered cash generating financial benefits, we have not considered the impact of diversion of waste from landfill (Spicer, Silverstream or Southern) and the consequential impacts on available airspace or landfill life.
- All cash flows are pre-tax.
- Under all models we have excluded haulage costs borne by the construction and demolition waste business. That is, users of the facility will cover their own haulage costs, as their decision to use the C&D facility over other facilities will be based on their own assessment of the haulage costs they would incur.
- All costs are for a construction and demolition waste facility only and do not include costs for the upgrade or relocation of the transfer station.
- Inflation has been applied to our forecast costs at the rate of 2% per annum.
- We have assumed an annual growth in general waste and construction and demolition waste of 1.2% per annum (inclusive of any volumes generated by Kainga Ora). Growth in waste is modelled based on an estimated 32,000 tonnes of construction and demolition waste received in class 1 landfills in the greater Wellington region. This is assumed to be comprised:
  - 31% at Spicer landfill
  - 38% in Silverstream landfill
  - 31% in Southern landfill

  We have assumed no change in the origin of landfill waste over the modelling period.
- The composition of existing construction and demolition waste available to a facility has been taken from Report 1 – Materials Composition and is assumed not to change during the modelling period.
- Modelling has been completed from the perspective of a ringfenced C&D facility and assumes that a gate rate equal to the current Spicer general waste disposal gate rate will apply. With waste levy and emission trading scheme cost increases due to occur in the next 3-5 years, this gate rate is expected to be lower than the landfill disposal rate in future. It is worth noting that net cashflows for PCC may differ as "revenue" derived by the facility will be offset (at least in part) by lost revenue from the landfill.

- If the landfill's current gate fees are set based on a breakeven cost recovery, then from an economic perspective it is appropriate to include gate fee revenue within the modelling for the proposed facility, as any landfill revenue that is forgone also results in an avoidance of an equivalent cost.
- Our base case assumes that there is an end market for all recoverable materials, however we have not allowed for any income to be generated from the sale of such materials. That is, we have assumed that there is a market that will be willing to accept the materials at no cost.
- Our modelling shows the small site exceeding the proposed maximum capacity of 9,000 tonnes in year 14. By year 20 the total volume is less than 10% higher than the maximum volumes, and we assume that the model, including its operating costs and capital requirements would be reviewed prior to this occurring.
- Kainga Ora volumes are based on the build programme provided to us.
- We have taken a conservative approach to development of the large-scale operation in that we have not considered co-location of the C&D facility with other resource recovery initiatives thereby assuming that all land acquisition or leases costs associated with his model are attributed to the C&D activity itself.

3 Financial comparison

The high-level results of the financial modelling are set out in Table 1. A 10-year cumulative cash flow is presented in the tables to align with Council's LTP period; the model is provided from years 0 to 20.

Table 1 High level model outputs

	Small model	Medium model	Large model
Initial capital outlay (year one)	9(2)(b)(ii)		
Total capital costs (20 years)			
10-year cumulative cash flow			
Year of break even			

The high-level results show that the medium scenario is the only scenario to provide positive cashflows over the first 10 years and breaks even earlier than the small or large scenarios. The large model is significantly hampered by the additional costs of the land lease, as also demonstrated below in Figure 2.

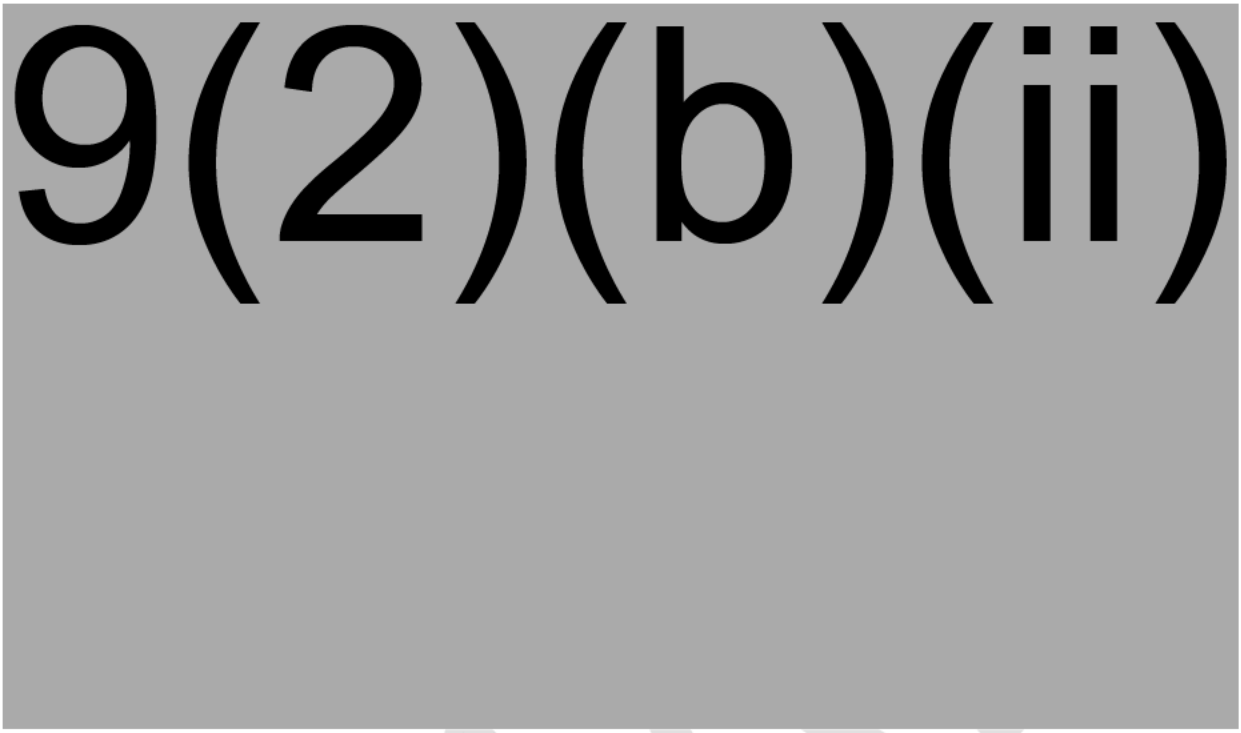

Figure 2 Operating costs (excluding depreciation) per tonne over modelling period for each scenario.

The above figure shows that the costs of processing a tonne of construction and demolition waste would be the highest in a small facility, with the medium facility being the cheapest.

3.1 Sensitivity

Sensitivity analysis results are provided in Table 2. The model outputs are significantly impacted by the presence of end a market for treated timber and hardfill. Uncertainty of end markets is discussed in Report 2 – Product Markets.

Our modelling also assumes that scrap metal will be received by the C&D facility in the first instance. Discrepancies in data associated with scrap metal are discussed in Report 1. As a gate fee will likely be charged for receipt of this material at the C&D facility, it is possible that scrap metal may be diverted by the existing network of scrap metal service providers before reaching the facility and therefore, the model is also sensitive to the receipt of this material.

Table 2 Sensitivity outputs

	Small model	Medium model	Large model
10 year cash flow (base case)	9(2)(b)(ii)		
No market for plasterboard, treated timber, or hardfill			

	Small model	Medium model	Large model
No market for treated timber	9(2)(b)(ii)		
No market for hardfill			
Ferrous metal excluded			

The comparison shows the following key points:

- While the large model has the ability to generate much greater cashflows over a ten-year period, it also has significant downside risk if a market is not able to be found for treated timber.
- The lack of ferrous metal receipt does not influence whether the medium sized facility will break even within the 10-year period.
- The small model does not even achieve breakeven within a 20-year period.

3.2 Incentivising diversion

The modelling contained in this report assumes that the construction and demolition waste facility would charge a gate rate that is the same as the gate rate being charged at the landfill. However, in order to incentivise customers to divert waste to the C&D facility, in the long term a reduced rate may need to be considered.

Our modelling shows that the long run costs of processing a tonne of construction and demolition waste in the medium facility are approximately 9(2)(b)(ii) (subject to volumes and contamination rates). This could be considered the breakeven gate rate (once the facility is fully operational) and any gate rate below this amount would likely result in the facility failing to break even.

We have not separately modelled a scenario where gate rates for construction and demolition waste are simply reduced by the waste levy amount. The financial impact of this is likely to be negligible as any reduction in revenue will be offset by an avoided cost in the landfill.

4 Conclusion

Based on this analysis, our view is that the medium scale operation would be the preferred option from a financial perspective as it offers potentially positive cash flows, while minimising the downside risk of being unable to find end markets for high-risk materials such as treated timber.

The result reflects the balance between scale and cost. The costs of running a medium scale facility are only marginally higher than those required to run a small-scale facility, however the increase in volumes improves the overall viability of the model.

A large-scale facility, on the other hand, requires the acquisition of more land, which is accompanied with lease costs (or opportunity costs) as well as potential additional consenting and compliance costs to enable waste operations. While there is a large uplift in volumes processed, the volume uplift is not sufficient to offset this increase in costs that comes with scale.

Report 5b – Peer review

A peer review of the financial model was undertaken by GHD and analysis contained within Report 5a was undertaken in early June 2021. The review resulted in amendments both to Report 5a and to the associated model (Appendix 1). The comments from that peer review, and the actions completed by Morrison Low to address those comments, are set out in Table 3.

Table 3 Peer review feedback and response

Comment	Morrison Low response
The list of assumptions is very useful for understanding how the Excel model is constructed (in the report these should probably come before the description of outputs). I would recommend going through all the key input assumptions in the model and describing them, for example a description of how the waste streams are built up for each of the three options is not included (it may be elsewhere in the reporting). Also, for assumptions that involve a choice or judgement, often it is good to note why a specific assumption has been used.	Global assumptions have been moved to the front of the report, with scenario specific assumptions included in Appendix 2.
It is very useful to have the inputs separated out, though possibly all of the inputs and assumptions could be on the same page, and because the output summary is focused on breakeven, that could also possibly be on inputs/outputs page. This would allow easy iteration, and also unable the user to see the assumptions for each of the three options lined up against each other.	No changes have been made to the model, and we note that this comment relates to the visual design rather than underlying logic. We have chosen to leave scenario specific assumptions on the same sheet as the scenario modelling to enable easy scaling of the model to incorporate additional scenarios as needed.
Because of the range of waste stream inputs, having a table that itemises them is excellent, maybe these could be summed at the bottom instead of the top.	Incorporated into model.
Is it realistic to assume that the metals waste streams that are currently diverted would go through these facilities, if this is separated would it not got go straight to recyclers?	This has now been addressed in the sensitivity analysis and summary.
Agree that there are risks around making 'optimistic' assumptions re recovered materials markets, but some additional information would be useful – although this may be covered in other reports.	The issues around the viability or existence of end markets for these materials are covered in Report 2 – End Markets.
In terms of the overall economics, if you assume the gate charge represents breakeven cost recovery for waste streams disposed of in the conventional landfill, and recovered	Spicer landfill is currently cash flow positive. Assumptions have now been updated to incorporate this point.

Comment	Morrison Low response
materials can be sold at zero revenue and avoid this cost, then showing a surplus for the operation is a correct treatment. Maybe this could be more explicitly stated, e.g. assumption 2 and assumption 11 in Report 5, which refer to avoiding existing landfill costs.	
There could be some discussion about incentivisation for users. For a user currently taking this type of waste to landfill, the choice of using one of these facilities would be cost neutral if going to the same location? The question would then be, could incentives be desirable to separate waste, and could some sort of differential be built on from the outset if you want a user to haul to a different location? I believe there is now an indicative schedule of how the waste levy will increase over time, so if this was incorporated in the model and a differential maintained, the overall impact on viability may not be significant. The incentivisation issue also seems to be relevant for any waste diverted from class 2-4 landfills in the large option, where their charging structures may be significantly lower.	Addressed in update to Report 5a. Incentives will need to be considered over the long term, the model does not reflect this. In its most simple form, an incentive scheme may involve charging a gate rate that is net of the waste levy (as it wouldn't apply). Financially this would have limited impact as the reduced revenue from gate fees would be offset by an avoided cost of the same quantum (assuming that the gate rate was set at a rate that enable council to recover its waste levy costs for unrecoverable materials). Modelling with the inclusion of incentives has been kept high level at this stage of the project. A more detailed approach could be investigated in subsequent project stages beyond the scope of this work.
The small facility seems to have a higher throughput in the out years than the maximum 9,000 tonnes nominated in Report 3.	Noted. This is now addressed in the update to report 5a.
The land lease for the large option is so significant (31% of total costs) – is it fair to exclude these charges from the other two options? The other way of looking at that is the effect of substantially improving the cash flow because you have a 'free' site.	The land lease would be paid to a third party, so is a legitimate outgoing under the large scenario. Land for the small and medium options would be contained within existing Council sites on land that is only able to be used for waste operations. There is therefore limited opportunity cost for the use of this land. It should also be noted that analysis of the large-scale option has not considered the effect of its potential ability to receive and process waste streams in addition to the C&D material.
Have you double counted upfront capital costs for the large option by using a land lease rate that is for land and buildings, and then also including the building cost in the other calculations for this option?	Upon review the original land lease rate provided included the lease of a warehouse. Capital costs have been adjusted. Some capital costs have been retained as it is likely that modification of the third-party site, and potentially consenting costs, would be required.

Comment	Morrison Low response
Also have you double counted equipment costs by allowing for the capital costs, and also a hire rate, in the small and medium options?	Equipment hire applies only to trommel, screen, and crusher, with other equipment owned. As the equipment differs, there is no double counting in the model.
The large option does not appear to have any hours for equipment hire, which would probably need to be at least 300 hours if the large option was ultimately processing nearly double the waste volume of the medium option – is this intentional?	Equipment hire is excluded from the large option as all equipment is assumed to be owned and capital costs of acquiring this equipment is incorporated.
The overall conclusions could discuss the importance of scale, the small option has relatively low throughput relative to its cost structure.	Cost per tonne have been addressed in 5a.
The benefits of having a cooperative partner in the setup phase are noted but the options that are initially reliant on relatively low Kainga Ora waste volumes incur some reasonably significant costs in the early years.	It is recognised that the phasing in of tonnage incurs high costs early on with break even (where applicable) occurring some time later. The phasing concept is included with the intention of mitigating quantity and quality risk and the ability to access viable product markets.
Also it could be helpful to illustrate the relative performance to have a summary or graph over the time series of the revenue per tonne and cost per tonne, margin per tonne, and margin as a percentage of revenue. This highlights the additional burden of land/buildings lease cost on a new site.	Revenue per tonne is consistent across all models. Accordingly, revenue per tonne and margin per tonne have been excluded. Similarly, the margin as a percentage of revenue mirrors the cost per tonne chart (as revenue is consistent across all models). Charts for cost per tonne have been included in the body of Report 5a.

4.1 Additional refinements to model

In addition to the peer review comments mentioned above, following various feedback and review session, the following changes were also made to the modelling and report:

- Staging of volumes received by facility under the large scenario has now been included to match the small and medium scenarios
- Additional capex has been included for the replacement of plant and equipment after 10 years in all scenarios.

Appendix 1 – Financial Model

Refer to associated excel file.

Appendix 2 – Scenario specific assumptions

Assumption	Small	Medium	Large
Capital cost timing	All in year zero, and then replacement of plant and equipment and temporary buildings in year 10	All in year zero, and then replacement of plant and equipment and temporary buildings in year 10 Hubs come online in year 11 and associated capital costs for hubs incurred in year 10.	All in year zero, and then replacement of plant and equipment and temporary buildings in year 10
Purchased equipment	1 x 20 Tonne Loader 1 x 20 Tonne excavator 1 x Timber shredder	**Initial** 1 x 20 Tonne Loader 1 x 20 Tonne excavator 1 x Timber shredder **Hubs – additional (per hub)** 1 x 10 Tonne Loader 1 x 10 Tonne excavator 1 x Crusher 1 x Screener 1 x Trommel	2 x 20 Tonne Loader 2 x 20 Tonne excavator 1 x Timber shredder 1 x Crusher 1 x Screener 1 x Trommel
Hired equipment	1 x Crusher 1 x Screener 1 x Trommel	**Initial** 1 x Crusher 1 x Screener 1 x Trommel Purchased once hubs come online	None
Staffing	0.5 x commercial and contract manager 1 x site supervisor 0.5 x Admin and customer	**Initial** 0.5 x commercial and contract manager	1 x commercial and contract manager 2 x site supervisor 2 x Admin and customer

Assumption	Small	Medium	Large
	service 1 x labourer	1.5 x site supervisor 1.5 x Admin and customer service 1.5 x labourer **Hubs – additional (per hub)** 0.5 x site supervisor 0.5 x labourer	service 3 x labourer
Land lease and costs	We have assumed that the existing site at Spicer landfill will be available for use free of charge	We have assumed that the existing site at Spicer landfill will be available for use free of charge, and that any similar site required for future "hubs" under the medium sized model would similarly be available free of charge.	We have assumed that the site and building will be leased. Lease costs based on Colliers' market report for industrial sites in the Greater Wellington region. We have assumed that there is no opportunity to generate cash from the "free" site at the Spicer landfill We have not considered co-location of the C&D facility with other resource recovery initiatives thereby assuming that all land acquisition or leases costs associated with his model are attributed to the C&D activity itself.
Haulage costs	Assumed nil	We have allowed for the cost of acceptance of material at the hubs but we have not included any haulage costs for the transport of processed, or unprocessed, waste from the hubs to the main facility under the medium scenario. This is due to the uncertainty associated with the quantity that would be processed at the hubs versus Spicer. It may be that the processing equipment is moved	Assumed nil

Assumption	Small	Medium	Large
		between the sites, not the material.	
Timing of waste sources	Kainga Ora from year 1 Spicer C & D and steel from PCC in year 4	Kainga Ora from year 1 Spicer C & D and steel from PCC in year 4 C& D and steel from Kapiti Coast and Silverstream year 6 C & D from Southern and steel from wider region year 11	Kainga Ora from year 2 Spicer C & D and steel from PCC in year 2 C& D and steel from Kapiti Coast and Silverstream year 6 C & D from Southern and steel from wider region year 11 C& D diverted from Class 2 – 4 landfills from year 11