Report No:	RESC11-08-05
File No:	R605-1
Date:	26 July 2011
Decision Required	

REPORT SUMMARY

Report to: Engineering Services Committee
Meeting Date: 4 August 2011
Report Author Sarah Downs, Transportation Planning Officer
Subject: **Motueka Flood Control Project**

EXECUTIVE SUMMARY

This report investigates the practicable options for the Motueka Flood Control project. It is supported by a technical report written by the consultants, MWH. It takes into account the benefits and disadvantages of each of the practicable options.

It also includes further investigative work on the impacts of gravel extraction as requested through public consultation at stage 'b' of Section 78 of the Local Government Act (outlined in paragraph 2.5). The report asks the Engineering Services Committee to short-list their preferred options so that these may be consulted on at stage 'c' outlined in Section 78 (paragraph 2.5)

RECOMMENDATION/S

That the report be received.

DRAFT RESOLUTION

THAT the Engineering Services Committee receives the Motueka Flood Control report, RESC11-08-05 and;

THAT the Engineering Services Committee approves that the rebuild, refurbishment and status quo practicable options are carried forward for public consultation on 23 and 25 August 2011 as noted in the report, RESC11-08-05; and

THAT the Engineering Services Committee approves the discarding of the spillways and secondary stopbanks as practicable options as noted in the report, RESC11-08-05; and

REPORT SUMMARY

THAT the Engineering Services Committee acknowledges that further modelling works has been undertaken on gravel extraction that was raised in the submissions. Gravel extraction does not become a separate option but could be considered as an important part of the river maintenance programme as noted in the report, RESC11-08-05; and

THAT the Engineering Services Committee approves the use of the current rating model outlined in the 2009 Long Term Plan as the model to be used to inform the community of costs during the next round of consultation at stage 'c' of the Section 78 process of the Local Government Act as noted in the report, RESC11-08-05.

Report No:	RESC!1-08-05
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Report to: Engineering Services Committee
Meeting Date: 4 August 2011
Report Author Sarah Downs, Transportation Planning Officer
Subject: **Motueka Flood Control Project**

1. Purpose

1.1 The purpose of this report is to seek a decision from the Engineering Services Committee on whether they wish to proceed with public consultation on the shortlist of reasonable and practicable options regarding the Motueka Flood Control project.

2. Background

2.1 The project involves investigating flood control options to provide an affordable scheme for the Motueka River that meets the risks that the community is prepared to accept with regard to flood protection.

2.2 Tasman District Council's Ten Year Plan identified the need to reconstruct the current stopbanks on the Motueka River to provide better flood protection to the Lower Motueka Valley. Council has more recently considered the problem and the objectives for the project. Council concluded that there was a need to determine the best practicable and affordable flood control option. Council has also undertaken consultation with the community on this matter and on the issues that need to be considered when identifying the possible options for providing improved flood protection.

2.3 The practicable options that have been considered and evaluated are:

- Option 1 – Rebuild stopbanks
- Option 2 – Refurbish existing stopbanks
- Option 3 and 4 – Build spillways
- Option 5 – Build secondary stopbanks
- Option 6 – Status Quo – do nothing

2.4 Although the stopbanks have prevented major flooding in the past, they do not meet modern standards. It is known that the construction methods used did not provide adequate compaction of the central core of the banks. Recent

investigations have shown that the current engineering fitness of the stopbanks is such that they would not hold up under sustained or repeated flooding events. It is, therefore, considered that in their current state they do not provide adequate protection to local residents and their assets.

2.5 Council had previously resolved to follow the process outlined in Section 78 of the Local Government Act. Under the process consideration of community views must be given at the following stages:

a) The stage at which the problems and objectives related to the matter are defined;

b) The stage at which the options that may be reasonably practicable of achieving an objective are identified;

c) The stage at which reasonably practicable options are assessed and proposals developed; and

d) The stage at which proposals of the kind described in paragraph above are adopted.

2.6 The project is presently at stage ‘c’ and the purpose of this report is to make a decision as to which of the practicable options are investigated further for public consultation.

3. Present Situation/Matters to be Considered

3.1 At the Engineering Services Committee meeting on 23 June 2011, the committee received the report RESC-11-06-03 Motueka Flood Control. It resolved to consider the views of the community likely to be affected by, or to have an interest in, the project at the four stages of the decision making process as noted in the report.

3.2 It noted that Council staff would now use the report of community feedback to feed into a technical report for consideration by the Engineering Services Committee. This report would assess the reasonably practicable options to be consulted on as part of stage ‘c’.

3.3 It also noted that a technical report on the flood control options would be presented to the Engineering Services Committee. This report will also include further modelling and analysis work undertaken on the matter of gravel extraction raised in the consultation at stage ‘b’.

4. Financial/Budgetary Considerations

4.1 The final preferred option will be fed into the Long Term Plan where there will be a budgetary consideration. Rating options will need to be investigated further once this preferred option has been chosen.

5. Options

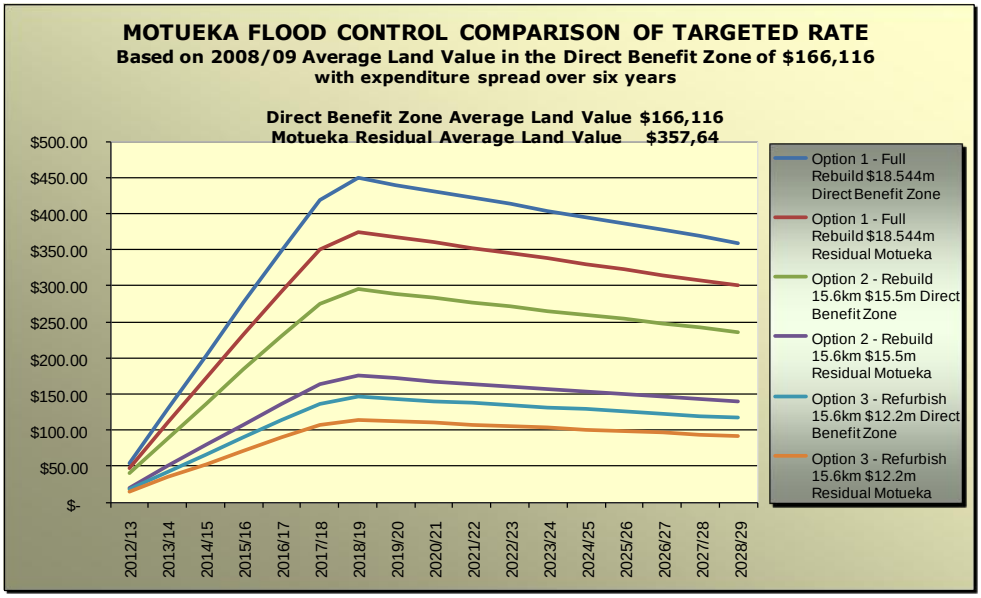
Option	Proposed Scheme	Comments
1	**Rebuild** the right and left stopbanks.	Approximately equivalent to the stopbank option previously proposed to the community.
2	**Refurbish** the right and left stopbanks.	Would need to include all feasible and cost effective options for improving bank structure.
3	**Spillway** over right bank, and provide secondary banks set back to create channel for overland flow and take the pressure off existing stopbanks. Do minimum refurbishment of the existing stopbanks. This option was split into two at the MCA workshop to represent the spillway located either at Woodman's Bend (Option 3A) or opposite Fry's Island (Option 3B).	Likely to be complications around land ownership and transport routes within the secondary flow path. Land and property within the secondary flow path would be at a lower level of protection. Possible future insurance issues.
4	**Spillway** over left bank and provide secondary banks set back to create flow path to west of Riwaka. Do minimum refurbishment of the existing stopbanks.	Possible, but the influence of other streams and rivers will need to be considered. Likely to require significant ground works to create secondary flow path. Land and property within the secondary flow path would be at a lower level of protection. Possible future insurance issues.
5	**Secondary stopbanks** on both sides of the river, and create secondary flow paths. Do minimum refurbishment work on original stopbanks and crest levels to meet 100 ARI design standard.	Additional protection to Riwaka town likely to be required. Land and property within the secondary flow path would be at a lower level of protection.

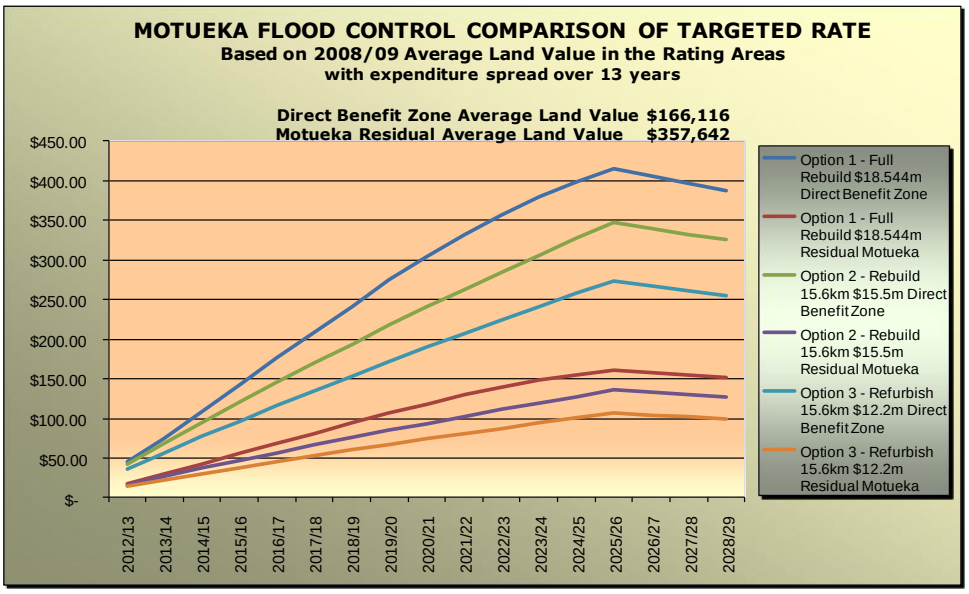
5.1 There is a sixth option of keeping the status quo ie, do nothing apart from the normal river maintenance programme.

5.2 Gravel extraction was further investigated as an option as a result of public consultation at stage ‘b’.

5.3 The short-listed options will be presented to the community under the current targeted rating model of 60:30:10 which was used in the preparation of the 2009 Long Term Council Community Plan.

5.4 An indicative targeted rate assessment for the different options has been carried out to demonstrate the possible rating effect from the different options. This is consistent with what was done for the 2009 Ten Year Plan. The assessments are provided in the graphs below. The first spreads the project over six years with the second being over 13 years.





5.5 The above graphs are to be used with caution as they are designed to provide a comparison between options. The actual rating areas will need to be confirmed and reassessed in terms of the benefits of the options.

5.6 However the graphs show that ratepayers costs have reduced as a result of more robust information and changing the final project to reflect the affordability concerns of the community.

6. Pros and Cons of Options

6.1 Secondary stopbanks (Option 5) and spillways (Options 3 and 4) have been dropped from this further analysis. Further investigation revealed that these options would not meet the objectives of the project set out in stage 'a'. The objective of the project was to prevent water from going either over or through the stopbanks. The Multi Criteria Analysis also confirmed this conclusion.

6.2 Work on the secondary stopbanks showed that the cost of these banks would be lower but a greater area of land would be flooded. There would also be ongoing management issues to ensure that structures and land form were not changed in the secondary containment area. This could be a costly process.

6.3 The cost of the land purchase and complex negotiations required to allow this option to proceed would make it unfavourable. The purpose of protecting the horticultural land immediately adjacent to the existing stopbanks would not be achieved.

6.4 A key requirement of the stopbank system is to be of sufficient height to contain the "design standard" flood. Analysis shows that in many locations the stopbanks could be overtopped if this level of flooding occurred. Creating spillways would limit the flood level and therefore prevent overtopping of the stopbanks. However, by providing spillways there would be some inundation of properties and this according to the objectives is not a preferable option. Also, consideration would need to be given to the fact that it would reduce the number of beneficiaries to share the cost of the flood control works.

6.5. As with secondary stopbanks, there would be ongoing management issues for Council, which would be difficult and costly to implement.

6.6 The remaining options that have been considered further as part of the technical report are provided in the table below. Please note that the identified costs in the table are only indicative at this stage and do not include things such

as land costs and increased river maintenance. No further assessment of costs for the Secondary and Spillway options was carried out as these projects do not meet the project objectives.

Rebuild stopbanks – this relates to the total rebuild of the full length of the stopbank (4m wide crest and 1m vertical to 2.5m horizontal slope on the town side, 1:3 on the river side)	**The benefits of this option are:** • **BCR = 1.34** • **Best protection for the whole community** • **Would meet the current best practice "design standards".**	**The disadvantages of this option are:** • **Potential flooding could occur during the rebuild phase** • **Excludes Peach Island and Brooklyn Stream stopbanks.** • **Land ownership issues**
Refurbishment – this is the addition of fill materials to the existing stopbank to raise the crest level and/or widen the stopbank.	The **benefits** of this option are: • BCR = 1.50 • It is cheaper than the rebuild option • Any fill on the river side provides an additional barrier to the saturation of the stopbank and therefore enhances stability • It will contain the 1% AEP "design flood"	The **disadvantages** of this option are: • There are possible land ownership issues • Further investigation would be required on the sourcing of suitable material for the stopbank construction. • Excludes Peach Island, Brooklyn Stream stopbanks, Hurley and Kiwifruit stopbanks. • Does not offer as much protection as the rebuild option
Status Quo – Keeping the stopbanks as they currently are. The usual river maintenance programme would continue	The **benefit** of this option is: • No significant capital expenditure above the programmed annual asset maintenance costs	The **disadvantages** of this option are: • The stopbank crest profile and cross section would remain the same, so would be prone to flooding • BCR = 0

6.7 These options have been further investigated along with some additional modelling carried out for the removal of gravel to improve flood dynamics.

6.8. The extraction of gravel does have some merit as a concept to improve flood capacity. Other advantages include:

- The reduction of overtopping;
- Reducing the need to quarry outside the stopbanks; and
- Could be undertaken in conjunction with sourcing materials (eg, silt) for the stopbank upgrades.

6.9. However, it is considered that the extraction of gravel would not sufficiently avoid the need to improve or replace the existing stopbanks. The following reasons support this consideration:

- The natural protection to the foundations of the stopbanks buffer zone would be reduced;
- It will increase the risk of under seepage;
- Does not address the problem that areas of the stopbanks are weak;
- Gravel should not be extracted from the active channel as this will affect groundwater;
- Trees lining the banks of the river will not be able to be moved as they shade the river and provide some bank protection in flood events;
- Gravel extraction below the bridge at SH60 would be ineffective in reducing the flood effects at high tide when the peak creates the greatest risk; and
- It will be an ongoing project as more gravel will be moved downstream in flush events. This means ongoing river works will be required which is costly.

7. Evaluation of Options

7.1 **Rebuild –** This option is the most expensive but will offer the most protection to the whole community. The hydrology modelling report shows that the immediate benefits of a full rebuild scheme are somewhat limited, so the cost is somewhat limiting. In the last round of consultation at stage ‘b’, the community were not in favour of this option and that cost was the prohibitive factor. The cost of the scheme is less than originally suggested by approximately $8 million. A couple of submitters were not averse to the idea of rebuilding the stopbanks where they were most at risk of being breached. There is also the chance that whilst the rebuild occurs that flooding may occur as the existing stopbank is removed to make way for the new one.

7.2. **Refurbish –** the Multi Criteria Analysis shows that the full refurbishment option is the preferred option out of the short list. This is because it has a higher benefit cost ratio than the rebuild option as it is significantly cheaper and it avoids the temporary increase in flood risk while the existing stopbank is removed to make way for the new stopbank.

7.3. It is suggested that to keep costs down for both the Rebuild and Refurbish options that Peach Island, Brooklyn Stream stopbanks and the Hurley and Kiwifruit stopbanks are left as they currently are. Modelling has shown that when the Motueka River is flooding that the Brooklyn Stream stopbanks will not be overtopped.

7.4 It is important to recognise that rain events are likely to affect both the Motueka and Brooklyn catchments and therefore some protection/improvements work for the Brooklyn Stream stop banks may be required. This will require some further work as part of the whole flood control project.

7.4. **Status Quo –** this option will not incur any extra costs to the community beyond the annual maintenance programme. However, there would be no extra protection to the community in the event of a flood at 1% AEP event. The Council will need to take into account that there are areas of vulnerability in the existing stopbanks, which will require ongoing maintenance. Since 2005, there has been a marked improvement in the extent and quality of rock revetment along the edge of the river channel. Maintenance includes annual mowing and inspection of the stopbanks.

7.5. Gravel extraction does have some merit as a concept to improve flood capacity but has considerable issues regarding land ownership and water conservation order that are significant. The benefits would not be sufficient to avoid the need to replace or improve the existing stopbanks. It should be considered further as a way of improving river maintenance, along with a potential source for materials required for rebuilding or refurbishing the stopbanks. However it cannot be considered as the option to address the flooding risk from stopbank failure in the future.

7.6. When presenting the shortlisted options to the community during the consultation process, the rating model will be based on the one currently used in the 2009 Long Term Plan. This will be done on a 60:30:10 split. However, it needs to be recognised that a new rating model may need to be developed once a preferred option has been selected.

8. Significance

8.1 This is a significant decision according to the Council's Significance Policy because the project will have a considerable impact on a large number of residents and ratepayers in the Motueka area and across the district. Depending on the preferred option, the project could cost over $10 million.

8.2. As stated in paragraph 2.5, Council has previously resolved to follow Section 78 of the Local Government Act. The consultation on this project will also include public input as part of the special consultative procedure of the 2012 Long Term Plan.

9. Recommendation/s

9.1 That the report be received.

10. Timeline/Next Steps

10.1. Consultation will take place on the short listed options on 23 and 25 August 2011 to the community. The feedback will form the basis of a report back to Council on 9 September 2011, where a final preferred option will be selected. This preferred option will be fed into the Long Term Plan.

11. Draft Resolution

11.1 THAT the Engineering Services Committee receives the Motueka Flood Control report, RESC11-08-05 and;

11.2 THAT the Engineering Services Committee approves that the rebuild, refurbishment and status quo practicable options are carried forward for public consultation on 23 and 25 August 2011 as noted in the report, RESC11-08-05; and

11.3 THAT the Engineering Services Committee approves the discarding of the spillways and secondary stopbanks as practicable options as noted in the report, RESC11-08-05; and

11.4 THAT the Engineering Services Committee acknowledges that further modelling works has been undertaken on gravel extraction that was raised in the submissions. Gravel extraction does not become a separate option but could be considered as an important part of the river maintenance programme as noted in the report, RESC11-08-05; and

11.5 THAT the Engineering Services Committee approves the use of the current rating model outlined in the 2009 Long Term Plan as the model to be used to inform the community of costs during the next round of consultation at stage 'c' of the Section 78 process of the Local Government Act as noted in the report, RESC11-08-05.

Appendices:

Appendix 1 - Initial Assessment of Practicable Flood Management Options Lower Motueka River, Local Government Act 2002 s78 – Part of Stage C