

# **AGENDA**

## **CATCHMENT OPERATIONS COMMITTEE**

**Wednesday  
15 OCTOBER 2008**

for further information regarding this agenda, please contact:  
Julie Kennedy, 06 952 2800

**CONTACT** | **24hr Freephone 0508 800 800** | [help@horizons.govt.nz](mailto:help@horizons.govt.nz) | [www.horizons.govt.nz](http://www.horizons.govt.nz)

<b>SERVICE CENTRES</b>	<b>Kairanga</b> Cnr Rongotea & Kairanga-Bunnythorpe Rds Palmerston North	<b>REGIONAL HOUSES</b>	<b>DEPOTS</b>	<b>Palmerston North</b> 11-15 Victoria Avenue	<b>Levin</b> 11 Bruce Road
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	<b>Taumarunui</b> 34 Maata Street				
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Notice is given that a meeting of Horizons Regional Council will be held at 10.00am on Wednesday, 15 October 2008 in the Tararua Room, Regional House, 11-15 Victoria Avenue, Palmerston North.

## **ORDER PAPER**

Agenda Pages

### **Catchment Operations Committee**

10.00am Wednesday, 15 October

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**RECOMMENDATIONS IN REPORTS ARE NOT  
COUNCIL POLICY UNTIL ADOPTED BY COUNCIL**

### **NEWS EMBARGO**

Items in this agenda may be subject to amendment or withdrawal at the meeting. Items are embargoed until two days before the date of the meeting.

Reporters who do not attend the meetings should seek confirmation of the agenda material or proceedings from the Chief Executive prior to any media reports.





## CATCHMENT OPERATIONS COMMITTEE

### COMMITTEE MEMBERS

Cr DB Meads (Chair)	Cr MC Guy (Deputy Chair)
Cr EB Gordon	Cr PW Rieger QSO
Cr GP Murfitt (ex officio)	Cr RG Walker JP

### AGENDA

**15 October 2008**  
**10.00am**

	<b>Pages</b>
1. Apologies	
2. Late Items: To consider, and if thought fit, to pass a resolution to permit the Committee to consider any further items which do not appear on the Order Paper of this meeting and/or the meeting to be held with the public excluded. Such resolution is required to be made pursuant to Section 46A(7) of the Local Government Official Information and Meetings Act 1987, and the Chairperson must advise:  (i) The reason why the item was not on the Order Paper, and (ii) The reason why the discussion of this item cannot be delayed until a subsequent meeting.	
3. Members' Conflict of Interest Members are reminded of their obligation to declare any conflicts of interest they might have in respect of the items on this Agenda.	
4. Confirmation of Minutes – 13 August 2008	1 - 8
5. River and Drainage Engineering Report <i>Report No: 08-179</i> <i>File No: PRD 5 00</i>	9 - 26
6. Lower Manawatu Scheme - City Reach Project – River Diversion at Anzac Park Cliffs <i>Report No: 08-183</i> <i>File No: PRD 5 16</i>	27 - 42
7. King's Canal Overflows in Foxton <i>Report No: 08-182</i> <i>File No: PRD 4 03</i>	43 - 48
8. Makerua Drainage Scheme: Spiers – Kingston Capital Works <i>Report No: 08-180</i> <i>File No: PRD 4 08</i>	49 - 52

9.     Makerua Drainage Scheme: Mangaore Pumpstation  
       *Report No: 08-181*  
       *File No: PRD 4 08* 53 - 54
  
10.    Sustainable Land Use Initiative (SLUI) 55 - 56  
       *Report No: 08-176*  
       *File No: ELM 6 00*
  
11.    Members' Questions

M J McCartney  
**CHIEF EXECUTIVE**



Minutes of the fifth meeting, seventh triennium, of the Catchment Operations Committee of Horizons Regional Council held in the Council Chambers, Palmerston North City Council, 32 The Square, Palmerston North at 10.07am on Wednesday 13 August 2008.

**PRESENT** Crs DB Meads (Chairman), EB Gordon, MC Guy, PW Rieger QSO, RG Walker JP, and GP Murfitt.

**IN ATTENDANCE** Chief Executive Mr M McCartney (until 12.05pm)  
 Group Manager Operations Mr A D Cook  
 Committee Secretary Mrs E Rooney-Scotson

**ALSO PRESENT** Crs A Main (until 1.08pm), M Plowman, and J White (until 12.08pm), Ms C Webb (Media Liaison Officer until 1.09pm), Mr P Blackwood (Manager Investigations and Design from 11.00am to 1.45pm), Mr Graham Doull (Senior Design Engineer, from 11.00am to 1.45pm), Mr M Pedley (ratepayer), and a member of the public.

#### **APOLOGIES**

An apology was noted from Cr L Bailey. It was noted that an apology had been received from Mr M Neeson, Principal advisor, MAF Policy.

#### **LATE ITEMS**

There were no late items.

#### **CONFLICT OF INTEREST**

There were no conflicts of interest noted.

#### **CONFIRMATION OF MINUTES**

Consideration was given to the public and public excluded minutes of the meeting held on 11 June 2008. It was noted that the public excluded minutes had been released following the Catchment Operations Committee meeting.

**RD 08-39**

**Moved**

**Meads/Walker**

*that the Minutes of the meeting of the Catchment Operations Committee meeting held on Wednesday, 11 June 2008, be confirmed as a correct record.*

**CARRIED**

#### **RIVER AND DRAINAGE ENGINEERING REPORT**

*Report No. 08-135*

The purpose of this item was to report on progress with river and drainage activities for the two month period 1 June to 31 July 2008.

The Group Manager Operations (GMO) introduced his report and elaborated on items of interest, and answered Members' questions of clarification; including:

- § The proposed budget relating to the physical works scheduled for Anzac Cliffs was likely to increase significantly, therefore this would need to be put forward to the Long-term Council Community Plan for consideration at that time. It was suggested that the Lower Manawatu Scheme (LMS) City Reach Working Party be re-established to address issues relating to the Anzac Cliffs, and that the Mayor of Palmerston North City Council (Mr J Naylor) be invited to participate along with other City Councillors he wished to nominate. This would also provide an indication of the level of support there was in relation to the programme.
- § The need for a final review report for the LMS Rural Review by October was questioned, and it was suggested that this could wait until the consultation phase was completed, and a final report compiled at that stage.
- § It was noted that there were three major hearings coming up for the Lower Manawatu, Ohau, and Hokio Schemes, for which hearing committee membership needed to be arranged. Tentative dates for the LMS Hearing were planned for 21 and 24 November, which could clash with dates set aside for the One Plan Hearings.
- § For clarity, it was noted that the first bullet point of paragraph 53 was in reference to *Malcolm* Guy, and the 11<sup>th</sup> bullet point was in reference to *Murray* Guy.
- § A typographical error was identified in paragraph 57, and that the word 'intensity' should be 'instability'.
- § A public meeting had been scheduled for Foxton Beach to discuss various Lower Manawatu Scheme issues. This meeting would address the new LMS rating proposals, an update for the community on programmed physical works to mitigate storm surge risk, and a report on the coastal hazards investigations.

**RD 08-40**

**Moved**

**Guy/Murfitt**

*that the Committee recommends that Council:*

- a. **receives** and acknowledges the information contained in Report No. 08-135;
- b. **acknowledges** that a Schedule of Works Completed is available for inspection;
- c. **re-establish** the Lower Manawatu Scheme City Reach Working Party to address the Anzac Cliff issue, with membership comprising the four Palmerston North Regional Council members and the Mayor of Palmerston North City Council, and his nominated Councillors, and that a proposed meeting date be advised; and
- d. **delegates authority** to the Chairperson of the Catchment Operations Committee and the Chairperson of Horizons Regional Council to determine membership of the Hearing Committees required for the Lower Manawatu Scheme Rating Review, and the Ohau-Manakau and Hokio Scheme reviews.

**CARRIED**

## **FOXTON BEACH – COASTAL EROSION HAZARD ASSESSMENT**

*Report No. 08-137*

The purpose of this item was to inform Members of the findings of a coastal erosion hazard assessment for Foxton.

In addition to the 10 properties within the 2100ERZ zone as detailed in the report, it was noted that there were an additional four sections currently owned by Horowhenua District Council that were on the seaward side of those buildings.

It was clarified that it was best not to intervene in the natural processes relating to the movement of river mouths unless it was absolutely necessary, and accordingly it was not advisable to put new assets or developments in places where they might be affected by the natural processes.

It was suggested that it may be useful for guidelines to be developed and provided to Councils to provide some clear guidance relating to river mouth intervention, and also to assist with where buildings and other developments should be permitted in relation to coastal and river mouth hazards.

As the authority responsible for the management of land use and developments was the Horowhenua District Council (HDC), it was suggested that a presentation be made to that Council and the Foxton Community Board. It was noted that the hazard assessment report provided critical information, and it was desired that HDC manifest some of these aspects in the development of its land use rules and zones in its District Plan.

**RD 08-41      *Moved***

***Gordon/Guy***

*that the Committee recommends that Council:*

- a. ***receives*** the information contained in Report No. 08-137 and Annex;
- b. ***instructs*** the Group Manager Operations to discuss the implications of the defined coastal hazard zones with Horowhenua District Council Officers; and
- c. ***instructs*** the Group Manager Operations to seek an opportunity to present the investigation findings of the "Foxton Beach Erosion Hazard Assessment" to a scheduled workshop of Horowhenua District Council and Foxton Community Board members.

***CARRIED***

## **LOWER MANAWATU SCHEME – RURAL UPGRADE PROJECT**

*Report No. 08-138*

In addition to Report no. 08-138, consideration was given to the following tabled items:

- (i) Spreadsheet, Lower Manawatu Scheme Rate Calculations
- (ii) Spreadsheet, LMS Upgrade Programme – List of Works in Descending Priority Order
- (iii) Spreadsheet, LMS Scheme – Forecast of Total Expenditure and Funding
- (iv) Spreadsheet, Lower Manawatu Scheme Rural Upgrade Project – Sample Property Rates Comparisons

This item sought the Committee's endorsement of final proposals for flood protection upgrade works for the Lower Manawatu Scheme (LMS) excluding the Palmerston North City Reach.

It was noted that the reports proposed an expanded programme of capital works, refined cost estimates, and established priorities for outstanding work. As a result of a number of additional works, the timeframe for the programme had increased from 10 to 13 years.

Concern was expressed at the layout of the 'Forecast of Total Expenditure and Funding' spreadsheet, and the GMO advised he would ensure this was presented in such a way that the general public would be able to easily understand. In addition, he undertook to include additional sample property rate comparisons for Palmerston North and Feilding properties.

The work to be undertaken on the Kopane Spillway raising and Bridge replacement works was queried, and clarification was sought as to when each element was due to commence.

It was suggested that this information should be included in a future 'Across the Region' publication and/or a press release.

*The meeting adjourned at 12.08pm.*

*The meeting resumed at 12.45pm.*

*Cr J White left the meeting at 12.08pm.*

*Cr A Main was not present for resolution 08-42 (below).*

**RD 08-42**

**Moved**

**Guy/Murfitt**

*that the Committee recommends that Council:*

- a. **receives** and notes the contents of Report No. 08-138;
- b. **approves** the Final Lower Manawatu Scheme Flood Protection Upgrade Proposal for the purpose of stakeholder consultation;
- c. **notes** that the proposal and estimates assume a protection standard of 1% Annual Exceedance Probability;
- d. **notes** that one consultation process will address both the Upgrade Proposal and the Draft Lower Manawatu Scheme Rating Proposal; and
- e. **endorses** the proposed consultation strategy.

**CARRIED**

## **SUSTAINABLE LAND USE INITIATIVE (SLUI)**

*Report No. 08-139*

The purpose of this item was to update Members on progress for the implementation of the Sustainable Land Use Initiative (SLUI).

The Advisory Group and other interested parties had requested HRC lead some clarity around the carbon issue – in the form of a seminar outlining where the Government's carbon programme was at, and how the Kyoto Protocol fitted in, for example. This seminar would be attended by Chairpersons, Mayors, and Councillors with key experts invited to provide a brief précis of where carbon was at, and then to open up the floor for questions.

Clarification was provided on the MOU/MOE arrangements. It was identified that the whole farm plan was a voluntary process however once there was an investment of HRC or Government money then a MOU/MOE would be required.

It was requested that the opinions received from the taxation consultants regarding accounting options for landowners who had received grants or loans be provided to the Audit, Risk and Investment Committee.

**RD 08-43**

**Moved**

**Meads/Walker**

*that the Committee recommends that Council:*

- a. **receives** the information in Report No. 08-139 and Annex.

**CARRIED**

*Cr A Main left the meeting at 1.08pm.*

## **MANGATAINOKA SCHEME MANAGEMENT AND RATING AUDIT REPORT**

*Report No. 08-133*

The purpose of this item was to inform the Committee of the findings of an audit of the Mangatainoka Scheme, and to recommend minor changes to the Scheme Management Plan and Rating System.

It was requested that the spreadsheet on page 16 of the report be amended to more clearly present works costs in each river reach and their relative proportions of total works costs.

Cr Murfitt apprised members that in past years contributor rating could not be applied, therefore a component to reflect the contribution factor was included in the indirect benefit category. It was requested that this be further researched and taken into account when considering the inclusion of a contributor rating category for the Scheme.

**RD 08-44**

**Moved**

**Murfitt/Meads**

*that the Committee recommends that Council:*

- a. **receives** the information contained in Report No. 08-133 and Annex;
- b. **notes** the actions proposed in response to recommendations contained in the audit report; and
- c. **requests** that the audit report be presented to the Mangatainoka Scheme Liaison Committee.

**CARRIED**

## HAUNUI-RAKAUTAU DRAINAGE SCHEME REVIEW

*Report No. 08-134*

The purpose of this item was to outline the findings of the investigation undertaken to amalgamate the Haunui and Rakautaua Drainage Schemes; to outline the development of a new rating system for the combined Schemes; and to seek Council's approval for the release of the proposed Scheme and rating system for stakeholder consultation.

It was suggested that a letter be sent to Rangitikei District Council enquiring if there were any residual Rakautaua Scheme funds that should be transferred to the new scheme to be managed by Horizons.

It was further suggested that indicative rates information be included with the letter scheduled to be sent to all scheme ratepayers.

**RD 08-45**

**Moved**

**Gordon/Guy**

*that the Committee recommends that Council:*

- a. **receives** and notes the proposed Haunui-Rakautaua Drainage Scheme and Rating Report;
- b. **approves** the Report as the basis for further consultation with Scheme ratepayers;
- c. **approves** the proposed consultation programme; and
- d. **delegates authority** to the Chairman of the Catchment Operations Committee and the Chairman of Horizons Regional Council to determine the membership of the Haunui-Rakautaua Drainage Scheme Review Hearing Committee.

**CARRIED**

## LOWER MANAWATU SCHEME UPGRADE

### PROGRESS ON TAONU BASIN FLOOD MITIGATION PROPOSALS

*Report No. 08-136*

The purpose of this item was to inform the Committee of progress with individual landowner negotiations in relation to the expected impacts in the Taonui Basin arising from the proposed Lower Manawatu Scheme (LMS) Upgrade Project, and to present final legal documentation for the Committee's information.

It was noted that a meeting had been arranged with Taonui Basin landowners to be held on 21 August 2008, with a view to discuss progress with the compensatory arrangements for production losses, and to discuss other mitigation issues.

**RD 08-46**

**Moved**

**Rieger/Walker**

*that the Committee recommends that Council:*

- a. **receives** and **acknowledges** the information contained in Report No. 08-136 and Annex;
- b. **endorses** the amendments made to the Taonui Basin agreements.

**CARRIED**

**MEMBERS' QUESTIONS**

Cr Plowman queried a statement in the Mangatainoka Scheme Audit report in which reference was made to advice from Consulting Engineer, Gary Williams, in respect of the desirability of good channel alignment control. Cr Plowman noted that this was in contrast to advice previously received, and enquired as to whether this report signified a change in engineering practice and thinking. He referred to three sites in the Upper Whanganui River where applications for channel realignment works had been declined in the past.

The Group Manager Operations advised that the Upper Whanganui Scheme Proposal and the applicable Global consent allowed for channel realignment to be undertaken where it was appropriate and noted that Mr Williams had been involved in the development of that Scheme also.

It was noted that two of the sites referred to were outside of the Upper Whanganui Scheme. If an affected landowner wished to undertake channel realignment works at those sites, he could apply for the necessary consents and the proposals would be considered on their engineering merits.

Meeting closed at 2.13pm.

Confirmed

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GROUP MANAGER OPERATIONS

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CHAIRMAN



A Significant decision? <b>If Yes</b>	No
Do recommendations meet Significance Policy (contained within the LTCCP)	

**Item No: 5**  
**Date: 15/10/2008**  
**Report No: 08-179**  
**File No: PRD 5 00**

## **RIVER AND DRAINAGE ENGINEERING REPORT**

### **PURPOSE**

1. The purpose of this item is to report on progress with river and drainage activities for the two month period 1 August to 30 September 2008.

### **FINANCIAL IMPACT**

2. Funding provision for all activities reported on in this item is included in the 2008-09 Annual Plan, under the River and Drainage Schemes Activity.

### **BACKGROUND**

3. The focus of Scheme activity during the period has been the refinement of work programmes for the 2008-09 year and the implementation of the planting components of those programmes. Good progress has been made in that regard.
4. In addition, a considerable amount of preparatory work has been undertaken in relation to capital work programmed for the approaching construction season. That has involved surveys, design, drawing preparation, consent applications and contract documentation.
5. Some major projects are planned, some of which involve complex issues, and there is some risk that those issues could become contentious and cause unavoidable delays through either land entry or resource consent processes. Accordingly it may prove difficult to complete all capital works scheduled for the 2008-09 construction season. Ideally, planning for some of these major projects should be 12 months ahead of where it is now; however the intensive programme of flood protection upgrade, and increased Scheme service level proposals developed and implemented post-2004, have not allowed for the provision of the desired amount of planning time. To the extent possible, alternative works are being prepared to provide some fallback options.
6. There were no heavy rainfall/run-off events during the period that caused damage within Schemes; however inspections following a heavy rainfall/run-off event late in the previous period have identified substantial damage in the Rangitikei River Scheme.
7. In accordance with a requirement of the Environmental Code of Practice for River Works, annual works programmes for all Schemes were submitted to the Horizons Compliance Team, Fish and Game New Zealand and Department of Conservation.
8. The annual financial reporting requirements for the Scheme's activity were completed in mid-September. Annual Scheme reports, detailing the physical and financial performance against programmes and budgets, are due for completion by the end of December and good progress was made towards that objective in some areas.
9. A final claim in respect of the LAPP cover for damage incurred in February 2004 has been submitted, and loss adjustment negotiations are currently underway. It is anticipated that a final payment, including an allowance for reinstatement of damage to a rock lining on the Manawatu River upstream of the Fitzherbert Avenue Bridge, which will

form a contribution towards the cost of much more extensive work at that site scheduled for completion within the next two years, will be agreed in early October. That will bring to a conclusion a time-consuming process that has extended over a period of almost five years.

10. A claim for damages in respect of the Moutoa Floodway stopbank failure at Whirikino in 2004 is proceeding. The process is being managed by Heaney & Co on behalf of our insurers RiskPool; however staff continue to be involved in responding to discovery requests.
11. Members of both the Operations Group and the Communications Department have spent a considerable amount of time during the period preparing newsletters and media releases in respect of four separate Scheme consultation programmes. In particular the Lower Manawatu Scheme Upgrade and Rating Proposals have presented some challenges in terms of disseminating some complex information in an easily understood form to a number of different audiences. It is disappointing that poor performance on the part of delivery contractors has significantly detracted from an otherwise very good communications/consultation effort.
12. Work is progressing on the Lower Whanganui River Scheme on two broad fronts. Construction surveys, detailed design and consent application preparation have progressed well in relation to the Balgownie flood protection works, the first section of which is programmed for commencement early in 2009. It is anticipated that a consent application, addressing all of the Balgownie work, will be lodged on 2 October 2008.
13. Work is progressing concurrently on the development of visuals for use in publications and in presentations through the consultation process for Stage 2 (Anzac Parade and Putiki) of the Whanganui Scheme. Work has commenced on preparation of a newsletter scheduled for distribution in early November.
14. Staff have been invited to make a presentation on the Balgownie project in particular, at a Wanganui District Council Infrastructure Committee meeting scheduled for 22 October 2008.

## **ASSET MANAGEMENT**

15. The three-yearly review of the infrastructural asset management plans is progressing, although some slippage from the project timeline has occurred.
16. The capitalisation of assets for the end of the financial year, as required for inclusion in the Annual Report has been completed and audited. A total of \$7.86m of capital expenditure for the 2007-08 year was reported.
17. The three-yearly revaluation of assets has been completed, and audit approval has been obtained from an independent engineer. Our asset management system is currently being updated with the new rates. The revaluation of assets in the system requires an audit of assets entered since the last revaluation to ensure that the data is accurate.
18. In the meantime, work on the narrative sections of the Plans is progressing reasonably well. It is a requirement that we consult with stakeholders around the draft Plans, and it is intended that should occur through Liaison Committee meetings scheduled for October and November 2008. It is proposed that Committee and Council approval of the Plans be obtained at December meetings.

## **INVESTIGATIONS AND DESIGNS**

### **Whanganui River – Balgownie flood protection**

#### **Whanganui Flood Risk and Mitigation Options**

19. The design and pre-consent consultation for the proposed Balgownie Stopbank has been completed and the consent application has been prepared and lodged on 2 October 2008. A further meeting was held with Wanganui District Council officers to confirm the preferred option at the downstream (Wharf Street) end. The option identified is a very satisfactory one and is expected to cost less than the original design option. A meeting was held with the Whanganui River Maori Trust Board Manager to discuss the proposed work at Balgownie and the associated consent application.

#### **Taonui Basin**

20. Some additional detailed investigation and design work has been undertaken with respect to the lower Manawatu Scheme flood protection upgrade proposals on the Taonui Basin. In particular impacts and possible mitigation measures in relation to the land in Riverbank Road, not previously affected by floodwaters, have been further considered following initial negotiations with the principal landowner concerned.

#### **Kopane Bridge**

21. The design team has provided requisite inputs to this project. The design brief was completed for the bridge and road approaches.

#### **Rangitikei River: Scotts Ferry**

22. The construction survey and design of the proposed low-level ring bank have been completed. Construction plans are close to completion and a resource consent application will be lodged soon.

#### **Rangitikei River: Nagel's Island**

23. The construction survey and design of proposed stopbank upgrade works that will continue upstream from the Nagel's Island stopbank constructed last season, and which will complete the upper section of the Parewanui Flood Protection Upgrade by linking into a high terrace near Pukehou Road, have been completed. Construction plans are close to completion.

#### **Rangitikei River: Tangimoana**

24. A detailed site visit was carried out and design has proceeded on the proposed stopbank upgrade and extension. This is a very complex design due to the complex hydraulics of the Rangitikei River and estuary. For the 2008-09 construction season it is proposed to obtain a resource consent to upgrade the existing stopbank only. This will allow the first stage of a two-year project to proceed. Further design work and a second consent will be required in relation to the proposed downstream extension of the existing stopbank to prevent river and storm surge flows from entering the village.

#### **Foxton East Drainage Scheme**

25. A brief investigation has been undertaken in respect of localised flooding that has occurred in Foxton over the past two years, as a consequence of overflows from Kings Canal. A report is presented as a separate agenda item.

### **Regulatory Advice**

26. The section has continued to provide a large amount of specialist advice on flood risks in respect of re-zonings and subdivisions.

### **Design Advice**

27. Design advice has been provided in relation to several minor river engineering projects, both internally and externally.

## **SCHEME REVIEWS AND RATING SYSTEMS**

### **Ohau-Manakau Scheme – Partial review of Scheme and rating system**

28. A new draft rating classification has been developed for the Scheme, primarily to accommodate proposed major stopbank upgrade works. The classification was approved for the purpose of stakeholder consultation at the Strategy and Policy meeting held on 9 September 2008.
29. A newsletter was prepared and sent to approximately 1300 prospective ratepayers in mid- September. In addition, indicative rate invoices for the 2009-10 year were sent to approximately 100 direct benefit category ratepayers.
30. At a meeting held on 24 September 2008, the draft rating classification was explained to the small number of ratepayers who would pay very substantial rates for proposed flood protection improvements. While some of those present considered the proposed rates to be unacceptably high, the majority were of the view that the present flood risk needed to be addressed, and appeared to accept the need for a substantial rate increase.
31. A public meeting is scheduled for 30 September and submissions on the proposal will be received up until 10 October. A hearing is scheduled for 30 October and recommendations from the Hearing Committee will be presented at the November 2008 Council meeting.

### **Hokio Drainage Scheme Review and new rating system**

32. Council endorsed a review document, including a proposal to expand the Scheme area, and a proposal for a new rating system, at its June and July meetings respectively. Subsequently a newsletter was prepared and distributed in late August 2008 and a number of one-to-one meetings have been held in response to requests for further detailed information.
33. A presentation on the findings of the Scheme review, and particularly the proposal to extend the Scheme area, was given at a meeting of the Horowhenua District Council on 3 September. The Council was supportive of the proposal but expressed a desire that the Scheme also make provision for the periodic opening of the Hokio Stream mouth to mitigate high water table levels and surface flooding in the Hokio settlement.
34. The Scheme review findings and rating proposals were also presented at a public meeting held on 11 September. Those present were generally supportive of the proposals but also expressed a desire for some management of the Hokio Stream mouth to be accommodated within the Scheme.
35. Submissions closed on 26 September and approximately 25 submissions were received. A hearing is scheduled for 10 October. Recommendations from the Hearing Committee will be presented at the November 2008 Council meeting.

### **Lower Manawatu Scheme Rating Review**

36. A number of newsletters and advertorials describing both the flood protection upgrade proposal and new rating proposals have been prepared and were circulated at the end of September.
37. The flood protection upgrade proposal was explained at a meeting of all members of Liaison Committees for Manawatu Plains Schemes, held at Kairanga on 12 September 2008. The group, which had previously received a presentation on the new rating proposal, was generally supportive of the proposals, despite the advised significant increase in estimated project cost.
38. The following public meetings have been well advertised:
- |                             |                                   |
|-----------------------------|-----------------------------------|
| Manawatu District Council   | Tuesday 30 September at 9.30 am   |
| Rongotea                    | Thursday 2 October at 7.00 pm     |
| Feilding                    | Friday 3 October at 2 pm          |
| Foxton Beach                | Saturday 4 October at 10 am       |
| Shannon                     | Monday 6 October at 7 pm          |
| Palmerston North (Open Day) | Wednesday 8 October 10 am to 6 pm |
| Whakarongo                  | Thursday 9 October at 7 pm        |
39. Information on the rating proposal in particular will also be presented at four Liaison Committee meetings to be held in the Tararua area during October.
40. Submissions on the proposals will be received up until 31 October and a Special Hearing Committee will sit on 21 and 24 November 2008. Recommendations from that committee will be presented at the December Council meeting and, subject to Council approval, will be incorporated in the second draft of the Long-term Council Community Plan (LTCCP), to be finalised in early February 2009.

### **Haunui Drainage Scheme – Review and re-classification**

41. The Committee approved, for the purpose of stakeholder consultation, a review of the Haunui Scheme, incorporating the Rakautaua Drainage area, and a draft combined rating proposal, at its August meeting. Subsequently, detailed information and indicative rates assessments have been sent to all prospective Scheme ratepayers. A stakeholder meeting was held on 29 September 2008; submissions on the proposals will be received until Friday 10 October 2008; and a submissions hearing, if required, is scheduled for 24 October 2008. Recommendations from the Hearing Committee, or alternatively a final proposal, will be presented at the November 2008 Council meeting.
42. Some amendments to the initial proposal in respect of the Rakautaua area were forwarded to ratepayers, to address concerns raised at the 29 September meeting.

## **CENTRAL AREA**

### **General**

43. A “Self Help Monitoring and Response Group” (SHMRG) has been set up for the Lower Manawatu Scheme area. This is an informal group of Scheme ratepayers, set up to monitor and communicate information to the Council’s Operations staff and the Emergency Operations Centre, and to respond as directed, during wide-spread major flood events.
44. The Scheme area has been disaggregated into suitable lengths of river and each of these lengths has been assigned a Group Leader (co-ordinator) who will be responsible

for liaising with and providing direction to other nominated members within each of the those river lengths.

45. A detailed manual/information pack has been compiled for all Group Leaders. Additional materials storage depots have been arranged to store sandbags, sand, concrete blocks etc. Once the information pack has been approved for distribution a meeting for all Group Leaders will be arranged.
46. As requested at a recent Audit and Risk Committee meeting, a more detailed report on the operation of the Self Help Groups, addressing in particular the issue of member status during an emergency event, will be prepared for the December meeting of the Committee.

### **Lower Manawatu Scheme**

47. Works undertaken on Rivers and Streams within the Scheme during this period included the following:
48. **Manawatu River** - All Scheme floodgates were inspected and repairs/replacements undertaken as required. River edge fencing was either repaired or replaced at several sites.
49. The winter's planting programme was progressed, with willow poles planted at many sites along the river. All poles have been cut from the various Scheme rivers by Council staff.
50. A number of instances of inappropriate grazing of stopbanks have been identified during the period, and appropriate action has been taken in accordance with the Stopbank Grazing Guidelines. The extended wet period and associated weak soil condition has made the stopbanks very vulnerable to stock damage. A media release was prepared in an effort to increase awareness of responsibility for damage resulting from grazing of stopbanks.
51. A length of Scheme drain (Goodman-Badger drain) was machine cleaned to address silt build up and weed growth. Access to the drain was blocked during the summer months while the adjoining paddock was in crop. An erosion problem at the entrance to Higgins Crusher site, further downstream on the same drain, was repaired with concrete rip rap.
52. A short length of erosion on Mather's property, Foxton Beach, was repaired using rip rap material which was stockpiled on site.
53. The Palmerston North stopbanks were mown between river distance 75 km and 85 km. This was the first mow of the current financial year. Adjacent to the Palmerston North Golf Club, trees have been cleared and trimmed back from 1 kilometre of new stopbank to allow mower access.
54. In the Fitzroy Bend area, vegetation spraying has been undertaken in preparation for planned minor earth works. In addition, material stockpile areas have been prepared for planned City Reach works.
55. **Mangaone Stream – City Reach** - Scheduled stopbank mowing, general maintenance and tree clearing work has been undertaken through the City.
56. **Oroua River** - General maintenance work included the clearance of several large trees that were diverting flows into the opposite bank; the erection of new fencing adjoining recently upgraded stopbanks; willow planting in the vicinity of Reid's Line; and the stockpiling of rubble for 180 m of erosion repairs at six sites.

57. Tied tree works (240 m) were completed at the Fitzpatrick property and a further 30 m at the Rowe property. On the McBride property upstream of Boness Road, flood-damaged fences were removed and two tree groynes were incorporated into 35 m of new riprap. The site was also pole planted.
58. Upstream of the confluence with the Kiwitea Stream, true right bank, concrete rip rap material has been stockpiled to repair an erosion problem on that property (565 tonnes).
59. **Makino Stream** - Following elevated stream flows in late July, there were a number of sites both within and downstream of Feilding that required trees and debris to be removed from the channel.
60. **Stoney Creek** - A small amount of concrete rip rap was placed on the true left bank immediately downstream of Napier Road. Vegetation was removed from the stopbank and berm area on the true left bank at river distance 3.6 km.
61. **Mangapukatea Stream, Kara Creek and Tokomaru River** - Programmed inspections of the stopbanks and floodgates were completed on each stream.
62. **Mangaore Stream** - Major vegetation clearance was undertaken on both left and right banks of the Mangaore Stream, upstream of the Foxton-Shannon Road. Some channel clearing of old trees and gravel point bars, which were causing problems in high flows, were completed at the same time. Several small stopbank repairs were completed. Old stream edge fencing was renewed.

#### **Flood Damage Repairs (February 2004)**

63. Unsettled weather and fluctuating river levels experienced throughout the reporting period slowed progress with the outstanding flood damage reinstatement works, to be funded by way of Central Government grant. All of the reinstatement works to be funded by disaster insurance have been completed and the last insurance claim has been submitted to the Loss Adjustors.
64. Flood damage reinstatement works were progressed at the following sites:
  - Manawatu River at Netton's Property – 16.5 km river distance. Eight hundred and ten tonnes of armour rock was stockpiled on site in July, with a further 1186 tonnes in August. This total tonnage of 1996 tonnes has been used to complete the reinstatement of the river edge protection.
  - Manawatu River at Crighton's Property No 2 - 19.0 km river distance. A total of 1626 tonnes of armour rock has been delivered to stockpile. This will be placed when ground conditions improve.
  - Manawatu River at Moxham's Property - 21.9 km river distance. A total of 45 m of tied tree protection was completed.
  - Manawatu River at Seymour's Property No 1 - 34.6 km river distance. Reinstatement was completed by the layering and anchoring of existing willow growth over a distance of 60m.
  - Manawatu River at Seymour's Property No 2 - 35.4 km river distance. Reinstatement was completed using anchored and tied tree protection works over a distance of 180 m.

- Manawatu River at Hopcroft's Property - 81.7 km river distance. Two adjoining erosion sites were repaired, using a combination of anchored and tied tree works and the layering of existing willow, over a distance of 150 m.
- Manawatu River at Bell's Property – 87.9 km river distance. Reinstatement was completed using 45 m of anchored and tied tree protection work and a further 230 m of layering tree works.
- Manawatu River at Strawbridge's Property - 93.5 km river distance. Reinstatement was 50% completed with the placement of 327 tonnes of concrete rip rap material. The balance of the work will be undertaken when material is available.
- Oroua River at Ruawai - 40.6 km river distance. Reinstatement will be completed using a combination of permeable groynes and anchored tied tree works. The trees have been stockpiled on site and placement work has commenced.
- Oroua River at McKinnon's Property No 1 - 41.8 km river distance. A total of 1080 tonnes of concrete rip rap material has been used to reinstate damage at the site.
- Oroua River at McKinnon's Property No 2 – 41.9 km river distance. Reinstatement was completed using a combination of permeable groynes and tree groynes over a length of 80 m.
- Oroua River at Maurice's Property – 41.9 km river distance. A total of 245 tonnes of concrete rip rap material has been used to reinstate damage at the site.
- Oroua River at McKinnon's Property No 3 – 42.0 km river distance. A total of 563 tonnes of concrete rip rap material has been used to reinstate damage at the site.

### **Moutoa Sluice Gates – Upgrade Programme**

65. The major upgrade of electrical components at the gate piers is continuing. Pier numbers 4 and 5 have now been completed and the upgrade to Piers 5 and 6 has commenced.

### **Vegetation Management**

66. A programme of edge vegetation clearance has been developed and will commence in mid to late October. The spraying programme will commence following inspections in late November 2008.

### **Makino Project – Diversion Structure**

67. Little progress has been made on the Diversion Structure since August when the weather deteriorated, effectively preventing plant access to site. Sufficient rock has been placed to provide a reasonable level of protection to the structure during winter. Finishing work and the installation of the steel sluice gates will continue as soon as ground and stream flow conditions allow.
68. A contract for the electrical supply and remote control of the diversion structure gates has been awarded to Manawatu Precision Enterprises. Landowner negotiations are still in progress with the objective of achieving assured long-term protection of the underground power supply. Contract works will commence as soon as those issues have been resolved.
69. Landowner consultation in relation to the proposed right bank stopbank works has been concluded. An application for variation to the existing resource consent has been lodged

and is awaiting approval. Expressions of interest from suitably qualified earth-moving contractors are currently being sought and completion of the stopbank is targeted for 30 November 2008.

70. Construction works are in progress on the Pharazyn Road floodgates. Project completion is targeted for 20 October 2008.
71. It is anticipated that all Makino Project works will be completed by the end of November and that a commissioning event will be able to be held in early December 2008.

### **Lower Manawatu Scheme Rural Upgrade Project**

#### **Programme for 2008-09**

72. Documentation is currently being prepared for the following project works:
- Kopane Bridge design and construction supervision;
  - Oroua River left bank realignment and upgrade upstream of Kopane bridge;
  - Foxton Beach storm surge protection; and
  - Manawatu River, Staces Road stopbank upgrade.
73. **Oroua River – Kopane Bridge** - Tenders have closed and are currently being assessed for the design and construction supervision of a new bridge structure and associated roadworks. It is anticipated that the contract will be awarded, at least for the design phase, by early October. A project team has met on two occasions and work has commenced on the preparation of a resource consent application for the bridge construction, widening of the river channel, and connection of previously raised sections of stopbank. Good Earth Matters have been engaged to coordinate that process. Apart from obvious potential environmental effects arising from disturbance of the river channel at Kopane, this application must address the effects of the proposed works on flooding in the Taonui Basin. The application will most likely go to a hearing and a fixture for that is unlikely to be available before February 2009. Final drawings and contract documents for the physical works are expected to be completed by that time.
74. **Oroua River – left bank upgrade** - Landowner negotiations have been completed for the partial realignment and upgrade of the left bank stopbank upstream of Kopane. Agreement has been reached with some owners to contribute to the cost of bank realignment where that involves additional cost but also results in additional areas of flood-protected land. Where such a contribution cannot be agreed, upgrade works will proceed on the existing alignment. Consents are in hand and it is anticipated that a contract to undertake this work will be awarded in October to allow commencement as early as possible in the construction season.
75. **Manawatu River – Foxton storm surge protection** - Affected party consultation has largely been completed for this project. A resource consent application has been lodged and expressions of interest are being sought from suitably qualified contractors. It is anticipated that a contract will be awarded prior to year-end and that construction will commence early in the new year.
76. **Manawatu River – Staces Road** - Survey has been completed and design work is due to commence shortly. Insufficient information is available at this time to apply for resource consent application or to undertake further landowner consultation.

## Lower Manawatu Scheme – City Reach Upgrade Project

77. **Centennial Drive – Fitzherbert Bridge Rock Work** – A 350 m length of rock lining is planned for the true right bank immediately upstream of Fitzherbert bridge. The work will extend from the bridge to link into the substantial existing rock rip rap protection adjacent to Palmerston North College of Education and Horizons' hydrological recorder tower. Discussions and site visits with affected parties, including Palmerston North City Council, (PNCC), iwi, Fish and Game and our Catchment Information staff have been undertaken. Storage of rock in the area between Fitzherbert Ave and Centennial Drive on PNCC reserve land has been tentatively approved. Resource consent applications will be lodged in October, when the design has been completed and affected parties have forwarded approvals. Rock delivery to stockpile will commence when a contract to supply has been agreed, temporary fencing is in place and ground conditions improve at the site.
78. **Dittmer Drive enhancement element** – Construction work on the steps has been completed for some time but the wet ground conditions have delayed ground restoration surrounding the structure and the wider site access area. It is now anticipated that all restoration work will be completed by the end of the first week of October. Construction works in one form or another have been in progress on the Dittmer Drive river berm area almost continuously since February 2004, and nearby residents are looking forward to the end of that. Unfortunately the area will be disturbed again for a relatively brief period when that section of stopbank is raised in 2012-13.
79. **Programmed works for 2008–09** – Survey and investigations have been completed on all programmed work for the ensuing year. Preliminary drawings are being produced and are awaiting design inputs.

## Lower Kiwitea Stream Scheme

80. A channel maintenance and willow pole planting programme was initiated in mid-September 2008. A minor fresh interrupted these works temporarily resulting in some damage to new plantings. This planting programme incorporated netting groynes on larger two metre poles, extensions to some existing groynes, and minor layering at strategic locations.
81. Works commenced from the finishing point of last year's planting at river distance 2.2km, although layering of willow was carried out in an area downstream of this location. Pole planting and minor maintenance work was carried out up to Highway 54, but most of the planting was required within the lower half of the Scheme.
82. A total of 1680 one metre poles and 121 two metre poles were planted within this reach. A very small number of newly planted willow poles were lost as a result of elevated stream flows. The majority of poles utilised in these works were cut from willow trees within the Scheme that were established after the February 2004 floods.
83. A Liaison Committee meeting was held on 23 September 2008. An inspection of the Scheme by the Committee has been arranged for the first week in December 2008.

## NORTHERN AREA

### General

84. Weather conditions during August have been very wet, followed by a drier September. A significant rainfall event that occurred on 30 July 2008 caused very high river levels in the Rangitikei, Oroua and Pohangina Rivers. The Rangitikei River recorded 7 m at Mangaweka, which equates to a 1 in 25-year event. Extensive flood damage to Scheme

assets resulted. The Whanganui River peaked at 8.4 m on 3 August 2008. Flood levels were monitored throughout the night with the Whanganui Flood Action Plan being activated to the third Alarm level.

85. The area Engineer (Northern) position remains unfilled; however a new Senior Engineering Officer has been appointed and has assumed responsibility for three of the Northern Schemes, being Whangaehu-Mangawhero, Upper Whanganui and the vegetation management component of the Lower Whanganui Scheme.
86. Staff have been focused on refining work programmes for the 2008-09 year and making input to the review of asset management plans.
87. Staff have responded to a number of requests for advice, including in relation to potential stream erosion encroachment at two State Highway sites. An inspection of a large landslide on the Retaruke River revealed that a third of the channel had been blocked; however there was no threat of lateral erosion on account of the mudstone geology at the site.
88. Staff have attended two recent meetings of a Rangitikei River enhancement interest group. The group is seeking support with the development of a recreational access area adjacent to the Bulls Bridge. The initiative is consistent with Council's desire to enhance access and general amenity at popular river recreation sites and it is anticipated that the Rangitikei Scheme will be able to assist in some manner. Council may also wish to consider a more substantial input to an enhancement project through the LTCCP.

#### **Rangitikei River Control Scheme**

89. The flood event on 30 July 2008 and subsequent smaller events in August have caused substantial flood damage throughout the length of the Rangitikei Scheme. A jet boat inspection revealed that further damage has occurred at a number of sites that have been unstable and the subject of ongoing repair activity since 2004. A preliminary assessment is that high priority repairs at an estimated cost of \$675,000 are required. In some locations, major reinstatement works completed post-2004 are at risk. A further detailed assessment is required and it is proposed that a full report on the damage and funding implications be available for discussion by the Committee at its December meeting.
90. In spite of inclement weather conditions staff have been actively progressing maintenance programmes and have completed 450 m willow layering, 60 m of rock placement, 255 m of live tree bank protection work, spraying of pest plants over 7 km of stopbanks and replacing two flood-gates on the Parewanui stop-bank. The planting programme is progressing well with 9200 willow poles planted at 14 sites.
91. Design work, construction drawings and the preparation of consent applications in relation to three stopbank upgrade projects on the Lower Rangitikei River at Nagel's Island, Scott's Ferry and Tangimoana are progressing. Staff resources are stretched in the Northern Area and while some support around these capital projects is being provided by the Projects Team, it may not be possible to complete all programmed works during the 2008-09 construction season.

#### **Pohangina-Oroua River Control Scheme**

92. Severe weather conditions on 30 July 2008 caused havoc through the Ashhurst and Pohangina Valley areas with hundreds of trees felled and power and phone wires down. In addition the Oroua and Pohangina Rivers were flowing at relatively high levels. Fortunately, subsequent inspections have revealed very little additional flood damage to that which had occurred in the July 2007 flood.

93. The main focus during this period has been the planting programme with 3700 willow poles and 346 native trees planted on the Pohangina River at six sites and 7329 willow poles and 1610 native trees planted in the Oroua River at 11 sites. The native tree planting work has been funded by the He Tini Awa Trust.
94. A Scheme Liaison Committee meeting was held on 19 August primarily to discuss new protocols for undertaking erosion protection work within the Scheme. Landowners who wish to qualify for 25% funding assistance from the Scheme for erosion protection work will be able to undertake their own repair works or arrange their own contractors, subject to compliance with a number of terms and conditions. Subsequently a letter explaining the protocols and an associated form of agreement has been sent to all riparian ratepayers.
95. To date three agreement forms have been signed up for erosion protection work and one applicant has commenced work.
96. As required by the Scheme's gravel extraction resource consent, returns have been filed for August and September.

### **Upper Whanganui River Management Scheme**

97. In late August 2008 notice was given of the intention to undertake works in the river channel at Matapuna, to address a lateral erosion problem that was seriously threatening the integrity of a substantial rock lining and causing loss of farmed lower river terrace. The works would have been permitted under the 'global' consent held by the Scheme, were it not for the fish spawning exclusion period extending through to the end of September.
98. Initially both Fish and Game New Zealand and the Hinengakau Development Trust were informed of the proposed emergency works and agreed the work should proceed. However after the contractor had completed one day's work, iwi publicly opposed and obstructed the work to the extent that it had to be discontinued on health and safety grounds. Discussions and exchange of correspondence have taken place at a high level between Hinengakau Development Trust and Horizons over a period of four weeks and the way was finally cleared for work to recommence on 6 October 2008. However in the interim, additional damage has occurred and unnecessary additional costs have been incurred by the Scheme.
99. Clearly what has occurred on this occasion is entirely unsatisfactory and further effort must now be made to identify iwi's real concerns and to map out a path forward that will ensure the Scheme can be properly managed in the interests of its ratepayers.

### **Matarawa Flood Control Scheme**

100. Inspections have been carried out on all dams and at the Mateongaonga Stream restoration site and some progress has been made on design work for the proposed stopbank upgrade at Blinkbonnie, scheduled for the approaching construction season.
101. Lease agreements have been prepared in respect of all five Scheme detention dams and staff have discussed those with the property owners concerned. To date two property owners have indicated a willingness to execute the agreements.

### **Tutaenui Flood Control Scheme**

102. Inspections have been undertaken and design work for some proposed minor stop bank upgrade work on the Tutaenui Stream north of the Marton township has progressed in preparation for construction during the approaching summer months.
103. Letters with draft lease agreements enclosed have been sent out to all property owners who have detention dams on their properties. This is being followed up with a visit by a staff member to discuss and sign up individual agreements.

### **Porewa Flood Control Scheme**

104. Only minor channel clearing maintenance work has been undertaken during the period.

### **Makirikiri Flood Control Scheme**

105. Inspections have been completed on the drop structures and some repair works have been scheduled for next month. Concern has been expressed about the height of the stopbanks in Redmayne's property. The stopbank crest has been levelled and although there are some localised low spots the stopbank has been confirmed to be above the design height.

### **Haunui and Forest Road Drainage Schemes**

106. Both of these drainage Schemes have been inspected with scheduled maintenance work programmed over the next few months.

### **Whangaehu-Mangawhero River Management Scheme**

107. Weather conditions in the Whangaehu-Mangawhero Scheme area have been relatively dry which has enabled an early start to programmed vegetation management work. Work completed during the period has included the mechanical clearance of large trees from both banks over a distance of 2.3 km upstream of the railway bridge; the poisoning of trees over approximately 0.3 km; and planting of approximately 1200 willows in strategic locations. A major channel blockage on the Mangawhero River at Sicely's was cleared and the felling of large and unstable trees in that location is continuing.
108. Property owners encountered during inspections of both rivers have generally expressed positive support for the activity being undertaken.
109. A decision has been received in respect of the application for resource consent to undertake aerial spraying. The aerial spraying work is programmed for early 2009.

### **Lower Whanganui Vegetation Management Program**

110. An inspection of river edge vegetation has been completed and the development of a revised work programme is underway. Discussions have been held with Wanganui District Council staff, and further discussions with Whanganui River iwi are planned before physical work commences.

## **EASTERN AREA**

### **General**

111. For the second time within five weeks snow fell to low levels in the Tararua District. On this occasion, snow fell in Woodville and Dannevirke townships and on much of the surrounding farmland. A heavy rain event on 30 July 2008 resulted in the highest flood

levels for two years and in some instances, the highest for three years. While August was a wetter month, several fine periods during September allowed good progress with the planting programme.

112. Inspections of the Upper Manawatu River and South Eastern Ruahine Streams were completed following the 30 July 2008 floods and only minor damage was identified.
113. The revision of Asset Management Plans for Eastern Schemes is well advanced with plans for the Mangatainoka, South Eastern Ruahine, Upper Manawatu-Lower Mangahao and Tawataia-Mangaone Schemes being in their final draft form and ready for consultation with Scheme Liaison Committees in mid-October.
114. The 2007-08 Annual Report for all Eastern Schemes is progressing well and should be completed by mid-October.
115. While engineering advice enquiries have remained steady, there has been a huge increase in rating queries which have proved to be very time-consuming.

#### **Akitio Scheme**

116. Preparations for the next Liaison Committee meeting scheduled for 2 October 2008 are well in hand.

#### **Eastern Manawatu Scheme**

117. A decision has been received in respect of the application for resource consent to undertake aerial spraying. The aerial spraying work is programmed for February-March 2009.

#### **Mangatainoka Scheme**

118. Although there were several freshes during August and ground conditions were very wet, little damage to Scheme assets has been observed.
119. The focus during the period has been on completing the planting programme. Approximately 9000 willow poles and 1257 native and exotic trees have been planted on the Mangatainoka and Makakahi Rivers at 19 different sites.
120. An audit was conducted on the resource consents held for the Mangatainoka Scheme. In the Compliance Inspection report it was noted that activities carried out within the Scheme complied with the conditions of the resource consent. It was also noted that definitions of some terms in the consents need clarification and that in future aerial photographs should be taken when river flows are similar to those that existed when original aerial photos were taken, to ensure consistent "run riffle pool" counts. These issues will be addressed.
121. Notification has been received that the New Zealand Transport Agency has made budget provision of \$50,000 as a contribution towards the cost of proposed flood protection work in the Hamua area. That is in response to a submission made by Horizons approximately two years ago. Unfortunately, strong opposition to the proposed stopbank extension from a majority of affected ratepayers has resulted in the proposal being deferred, at least until the benefit of some proposed channel improvement works is known. In light of the above advice, further consultation with affected ratepayers will be undertaken.

### **South Eastern Ruahine Scheme**

122. A significant flood event was experienced in the South Eastern Ruahine streams on 31 July-1 August 2008, with many of the streams recording their highest flood levels for two years. While there was very little flood damage there is some channel clearing and minor bank erosion protection work that will be repaired within the annual budget.
123. Very good progress has been made on programmed maintenance and capital works on nine of the Scheme streams. Work completed during the period included 80 m of groynes, 360 m of layering, 6700 willow poles planted, 1400 native and exotic trees planted, 220 m of channel clearing, 90 m channel shaping, 90 m of fence repair, 1775 m of new fencing at the Mangapapa Gravel Reserve, 90 m tree bank protection work, 110 m drain cleaning and one culvert repair.
124. At no cost to the Scheme possum trappers have been reducing possum numbers in the gravel reserves with the result that willow plantings are looking very healthy.

### **Upper Manawatu – Lower Mangahao Scheme**

125. The largest flood event in two years occurred on the Manawatu River on 31 July 2008 with a flood height of 8.55 m recorded at the Upper Gorge site. Unlike previous floods that have been largely fed by the Tiraumea and Mangahao Rivers, this flood was mainly fed from the Ruahine ranges and the South Eastern Ruahine Scheme streams.
126. Inspections following the flood show only minor damage to Scheme assets. Some sites where damage might have been expected have fared very well.
127. The season's planting programme has been completed with 4000 willow poles and 858 native and exotic trees planted at 9 separate locations on both the Upper Manawatu and Mangahao Rivers.

### **Totara Reserve Project**

128. A flood event of 3.4 m was recorded at Mai's Reach Recorder Site on 30 July 2008. While the flood waters were elevated against the Churchill Drive Road Bridge, they did not enter the new camping area at the Totara Reserve. Inspections following this flood event show that the avulsed channel opposite Camp Rangi Woods has widened and is developing an improved alignment. The channel is actively scouring back towards the bridge and this will lower the flood profile adjacent to the reserve. Debris from the avulsion will be cleared following the end of the fish spawning season.

## **SOUTHERN AREA**

### **General**

129. Periods of heavy rainfall and high ground water tables have kept staff busy, ensuring that the Schemes' pump stations and drainage networks have been operating effectively.
130. A high level of demand for drainage advice was experienced as a result of the wet conditions, especially in the sand country areas where extensive surface flooding occurred over an extended period.
131. Following numerous calls concerning flooding and high water levels in and around Hokio Beach settlement, staff met with a representative of the Horowhenua District Council to consider options for addressing the problem, including excavating a new outlet to the sea for the river.

132. A meeting was held with representatives of the Manawatu District Council to look at flooding issues around the Te Kawau Drainage Scheme area and to discuss mitigation options.
133. Following the strong winds and power outages experienced during the previous reporting period, our electrical contractors have been kept busy responding to call-outs and replacing electrical components in pump stations that were damaged by the power spikes that accompanied the power failures.
134. A newsletter was prepared and sent out to all of the ratepayers within the Ohau-Manakau River Scheme advising them of the proposed upgrade works and revised rating system.
135. Public meetings have been held for both the Hokio Drainage Scheme and the Ohau-Manakau River Scheme, to present the findings of the recent Scheme reviews.

### **Ohau-Manakau Scheme**

136. On the Ohau River, two minor erosion protection works were completed: debris and willow regrowth were removed from several locations to ensure that the gravel beaches remain active; and a number of trees that were starting to restrict the channel at Catley's property were removed.
137. The timber boards that form part of the outflow structure on John Haines' property on the Ohau River have been replaced with a new steel gate. This will make it easier for the landowner to operate the gate when it is required to release ponded water trapped behind the stopbank.
138. A total of 2.4 km of drains were machine cleaned this period.

### **Manawatu Drainage Scheme**

139. Several large trees that collapsed into Whiskey Creek during the high winds experienced in late July were removed and the banks of the creek repaired.
140. As a result of the wet period and high drain levels, several roadside drains have started to slump. Although these slumps are not restricting the flow of water at present, staff are continuing to monitor the sites, and when ground conditions improve will arrange for repairs to be undertaken.
141. Weed build-up behind the Rangiotu Floodgates has been removed and a damaged floodgate which discharges into Burkes Drain has been replaced.
142. In conjunction with New Zealand Transport Agency, a 30 m section of Cameron's Line Drain has been piped in order to address a slumping problem and improve access into the adjoining property.

### **Makerua Drainage Scheme**

143. A temporary submersible pump was installed at Mangaore pump station to provide continued service while an assessment of damage to the primary pump was undertaken.
144. The pump condition assessment report has identified the need for very costly repairs, and that has prompted the consideration of other options. The purchase of a new pump is now recommended and is the subject of a separate agenda item.
145. Minor repairs were carried out on two floodgates discharging into Linton Main Drain.

146. A meeting was held on 24 September 2008 with a number of ratepayers affected by a substantial increase in the level of rating for the Spiers/Kingston/Makerua East rating category. The increase was related to a proposal to install a new culvert under SH 56. A separate agenda item refers to this matter.

#### **Koputaroa Drainage Scheme**

147. A floodgated culvert discharging into the Koputaroa Stream has been extended and a new headwall installed.
148. Silt build up has been removed from behind the Aratangata floodgate allowing the gates to open fully.
149. During the high winds experienced on 30-31 July 2008, several large trees were blown into and blocked the K2 Drain. Machinery was brought in to remove the trees and at the same time to clean the drain. During the work staff were informed by an adjoining neighbour that there were several species of native fish in the drain. The cleaning of the drain was stopped so the matter could be investigated by suitably qualified Horizons staff. It was subsequently agreed that the work could be completed but that further investigation would be undertaken to determine exactly what species of fish were present and how maintenance practices could be modified to minimise future damage to the habitat.

#### **Moutoa Drainage Scheme**

150. Work undertaken at Cook's pump station included the scheduled replacement of a second weed screen and the replacement of a damaged starter unit.
151. A total of 2.4 km of drains were machine-cleaned during the period.

#### **Te Kawau Drainage Scheme**

152. A damaged floodgate that discharges into the Sluggish Main Drain was replaced and a total of 2.0 km of drains were machine-cleaned during the period.

#### **Himitangi Drainage Scheme**

153. A total of 1.5 km of drains were machine-cleaned during the period.

#### **Foxton East Drainage Scheme**

154. A total of 0.1 km of drains were machine-cleaned during the period.

#### **Whirokino Drainage Scheme**

155. A total of 1.7 km of drains were machine-cleaned during the period

#### **ENVIRONMENTAL GRANTS WORKS**

156. Six new applications for grant assistance have been approved during the period, and a number of other expressions of interest are being followed up and will be processed over the next two to three months.
157. The status of all projects that have been approved and/or will come to charge in the 2007-08 year is as shown in the following table:

Name	River	Type of Work	Date Approved	Work Status	Estimated actual works cost (\$)	Value of Grant
Turakina Valley Group	Turakina River	Channel clearance	6/07/2007	85% completed (burning outstanding)	\$15,000 to complete	\$3,000
Charlton and Turner	Mangakokaka Stream - Dvke	Erosion protection and channel clearance	5/8/2008	Yet to commence	\$11,900	\$3,570
C Manderson	Rangitawa Stream (Halcombe)	Clearing of willow congested channel	29/9/2008	Yet to commence	\$7,000	\$2,100
B Smith	Taringamotu Stream	Channel clearance and erosion protection	29/9/2008	Yet to commence	\$15,000	\$4,500
M Webster	Turakina River	Channel clearance	13/8/2008	Yet to commence	\$5,000	\$1,500
R Turner	Mangakokako Stream	Channel clearance and erosion protection	29/9/2008	Yet to commence	\$7,000	\$2,100
C Taylor	Mangahao River	Erosion protection	20/8/2008	Yet to commence	\$2,850	\$855

## RECOMMENDATIONS

158. That the Committee recommends that Council:

- a. **receives** and acknowledges the information contained in Report No. 08-179; and
- b. **acknowledges** that a Schedule of Works Completed is available for inspection.

A D Cook  
**GROUP MANAGER OPERATIONS**

A Significant decision? <b>If Yes</b>	N
Do recommendations meet Significance Policy (contained within the LTCCP)	

Item No: 6  
Date: 15/10/2008  
Report No: 08-183  
File No: PRD 5 16

## LOWER MANAWATU SCHEME – CITY REACH PROJECT RIVER DIVERSION AT ANZAC PARK CLIFFS

### PURPOSE

1. This report is to update the Committee and Council about technical difficulties and projected cost increases for the proposed major realignment of the Manawatu River at Anzac Cliffs, and to set out alternative courses of action for consideration.

### FINANCIAL IMPACT

2. In December 2006, Council approved a budget of \$11.5 million for the Lower Manawatu Scheme (LMS) City Reach Project. That budget includes an allowance of \$1.5 million for the river re-alignment, with an additional \$1 million to be provided by the developer. It is now apparent that the planned realignment cannot be achieved within budget, and that Council might be faced with substantial extra expenditure. This item sets out options for discussion, and does not recommend any particular option. It is expected that any additional funding ultimately required would be approved through the 2009-19 Long-term Council Community Plan (LTCCP).

### BACKGROUND

3. On 13 February 2008 the Committee received an update on the River Realignment Project. The background and issues were set out in some detail. Site investigations had indicated that the project would encounter some technical difficulties, and approval was sought to carry out further investigations so that remedial measures could be formulated and estimates prepared.
4. The work had been programmed for the 2008-09 and 2009-10 construction seasons, but the additional investigations have taken time and it is no longer possible to commence work in the 2008-09 construction season. A further delay is now occurring because some new issues have emerged that require Council's consideration and decisions.
5. The new estimate for the realignment is \$4.2 million, of which Council's share would be \$3.2 million. This is a considerable increase over the budgeted sum, and less costly options have therefore been considered. The attached Annex A report "Lower Manawatu Scheme – City Reach Project - River Diversion at Anzac Park Cliffs" describes the background and the alternatives in detail.
6. The least-cost alternative is simply to allow the cliff to continue retreating without intervention. This was suggested in the first of the City Reach Upgrade agenda items in April 2006. The proposal put forward then had a relatively narrow focus to prevent the river from endangering the Palmerston North stopbanks. The risk to the stopbanks is that deteriorating river alignment at the cliff could eventually cause the city-side riverbank to come under attack. A rock lining on that riverbank could be constructed as and when necessary, perhaps not for many years.
7. Between April and December 2006, discussions about some wider issues took place between Palmerston North City Council (PNCC) and Horizons Regional Council (HRC) representatives. The existence of a building line setback near the top of the cliff and the

eventual long-term fate of houses adjacent to that line is of concern. The building line was put in place in about 1993, and was intended to accommodate 100 years of cliff retreat. However, home-owners near the building line will become very concerned well before that time, and substantial works will eventually be needed. There is an opportunity now to receive a substantial contribution from the developer in return for giving the work high priority.

8. The other concern was the public safety issue of a crumbling cliff, which was emphasised by a tragic event in the Pohangina Valley in December 2006.
9. On 19 December 2006, the full Council meeting therefore approved the updated proposal for the City Upgrade Project, including the realignment of the river at Anzac Park Cliffs. The alternative of ignoring cliff retreat was implicitly rejected.

### **STABILISATION OF THE RIVER CLOSE TO ITS EXISTING ALIGNMENT**

10. An intermediate option has now been formulated. A gravel embankment would be constructed in the river parallel to the cliff, and far enough out from the toe of the cliff to eliminate risks due to falling debris during construction. The river side of the embankment would have a rock lining placed against it, and would eventually become the new riverbank. Gravel for the embankment would be taken from the beach on the opposite bank of the river. The space between the embankment and the cliff would eventually fill up with material falling off the cliff. It would be desirable to fully or partly fill the space with gravel from the beach, and that will be done if a safe method can be found.
11. The retreat of the cliff would eventually be halted, but a number of years might elapse before confidence about the cliff edge location were sufficient to allow the building line restriction to be lifted. It is likely that the developer would see much less attraction in contribution to this project than he would to the \$4.2 million project.
12. Nevertheless it is a less costly way of limiting the retreat of the cliff, and could be done for \$2.3 million. This is considerably less than the \$3.2 million that would be Council's share of the realignment proposal discussed to date, but is rather more than the budgeted \$1.5 million. A \$1.5 million job could possibly be carried out, but would be less robust than the \$2.3 million job, and would carry a significant and probably unacceptable risk of failure.
13. This proposal would eventually halt the retreat of the cliff. It would not stop immediately, but erosion of the cliff's toe by the river would be slowed right down. The cliff would reshape itself to a flatter, more secure slope that could eventually be vegetated. Alternatively the cliff could be battered back and vegetated immediately to at least partially mitigate the risk of collapse. Once the cliff appeared to be stable, the location of the building line could be reconsidered, although this would need to be approached in a conservative manner.
14. The public safety issue would be addressed by this proposal, but not quite as promptly as with the \$4.2 million project.
15. Most importantly, this proposal would address the ultimate risk to existing development on the cliff-top and would also substantially mitigate the risk of progressive river encroachment into Anzac Park.

### **TIMING**

16. The \$4.2 million project has a degree of urgency, because the developer's \$1 million share is only available on the basis that the work should be done soon, before too much land is lost.

17. The \$2.3 million project possibly does not offer enough to the developer to merit a contribution. It is therefore much less urgent with regard to availability of funding, although the developer might see value in making some contribution in return for the works being given increased priority.
18. Pre-2004, the cliff was retreating at about one metre per year, and although it has been faster in the past few years, the rate of retreat will probably slow down soon until there is another very large flood. Postponing work until later in the seven-year City Reach Project programme would not create difficulties from the river management or construction point of view.
19. The safety issue will remain until the cliff retreat has been stabilised and the cliff vegetated. As residential development proceeds, the population near the cliff will increase with its associated risk to people, and particularly children, exploring the area near the cliff. The \$4.2 million project therefore has a safety advantage, although this is difficult to quantify.
20. A choice between the \$2.3 million project and the \$4.2 million project needs to be made reasonably soon if work is to proceed in 2009-10. Projects such as these have long lead times, with the need to gain consents and to carry out a tendering process that could be more complex than for our usual construction. Rock supply will also be an issue, and will probably have to be staged over two summers.

#### **LMS CITY REACH WORKING PARTY**

21. The LMS City Reach Working Party has been re-activated in order to discuss the issues around the river realignment. A meeting of the Working Party was held on 7 October 2008, background information was presented, and the issues were discussed. A further meeting will be held in late October after the Catchment Operations Committee has considered this agenda item and report, and after officers have discussed the new option with the developer.

#### **RECOMMENDATIONS**

22. That the Committee recommends that Council:
  - a. **receives** and notes the contents of Report No 08-183;
  - b. **notes** that, whichever option is chosen, substantial additional hitherto unbudgeted expenditure will be required if the river alignment adjacent to Anzac Park Cliffs is to be stabilised; and
  - c. **agrees** that funding provision for the option ultimately proposed be included in the draft 2009-19 Long-term Council Community Plan.

A D Cook  
**GROUP MANAGER OPERATIONS**

G S Doull  
**SENIOR DESIGN ENGINEER**

#### **ANNEX**

- A Lower Manawatu Scheme – City Reach Project  
 River Diversion at Anzac Park Cliffs



**Lower Manawatu Scheme –  
City Reach Project  
River Diversion at Anzac Park Cliffs**



**October 2008**

**Author**  
Graham Doull  
Senior Design Engineer

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**CONTACT** | 24hr Freephone 0508 800 800 | [help@horizons.govt.nz](mailto:help@horizons.govt.nz) | [www.horizons.govt.nz](http://www.horizons.govt.nz)

<b>SERVICE CENTRES</b>	<b>Kairanga</b> Cnr Rongotea & Kairanga-Bunnythorpe Rds Palmerston North	<b>REGIONAL HOUSES</b>	<b>Palmerston North</b> 11-15 Victoria Avenue	<b>DEPOTS</b>	<b>Levin</b> 11 Bruce Road
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	<b>Woodville</b> Cnr Vogel (SH2) & Tay Sts				

**POSTAL ADDRESS** | Horizons Regional Council, Private Bag 11025, Manawatu Mail Centre, Palmerston North 4442 | F 06 9522 929

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## 1. Background

In December 2006, Council agreed to a programme of flood protection, erosion control, and river enhancement works for Palmerston North. It was referred to as the Lower Manawatu Scheme City Reach Flood Protection Upgrade and River Enhancement Proposal. It was estimated that the seven year programme of works would cost \$11.5 million.

The programme was subsequently included in the Draft Annual Plan and in the Amendment to the Long Term Council Community Plan. All submissions but one were in support of the proposal, which was ultimately approved through adoption of the Annual Plan.

The work is now proceeding. The stopbank between Ruamahanga and Roxburgh Crescents has now been upgraded, and a major rock lining has been constructed at Dittmer Drive. The rock lining incorporates an environmental enhancement element to improve recreational access. Further stopbank upgrading will take place this summer.

The Project programme included a major work to realign the Manawatu River adjacent to the Anzac Park Cliffs. The river continuously undercuts the toe of the cliff, thereby causing ongoing erosion of the cliff. The work would address the progressive deterioration of river alignment and the ultimate impact that would have on the integrity of flood and erosion protection works on the right bank near the Manawatu Golf Club. The attached aerial photograph has the proposed new river alignment marked on it.

## 2. Anzac Cliff Building Line

The Palmerston North District Plan defines a building line on the terrace at the top of the cliff. Building between the cliff edge and the line is a prohibited activity. When the plan was drawn in December 2000, the separation between the cliff edge and the building line varied with location, up to a maximum of about 130 metres. That distance is now more like 120 metres.

Building of houses on the Aokautere side of the line is permitted. In time it can be expected that a row of high value houses will be located close to the line, where they can avail themselves of the excellent view. The cliff edge will migrate towards the houses over a period of time. While there is currently a wide separation between the cliff and the building line, that will progressively diminish.

Residents will be very concerned long before the cliff edge actually reaches their houses. While work to stabilise the cliff could possibly be deferred for a long time, at some point in the future it will become necessary to carry out expensive works to prevent further migration of the cliff.

The proposal to realign the river and stabilise the cliff is strongly supported by the City Council for two reasons:

- There is a medium to long term risk to residential development near the cliffs; and

- There are serious concerns regarding the more immediate risk of cliff collapse and associated risk to life. The section of river adjoining the cliff is readily accessible, and is a popular swimming area.

### 3. Private Developer Contribution

Further support for the realignment was provided by the private developer of land at the top of the cliffs. The issues referred to above could have been adequately addressed at a much later date either by a channel realignment or by other alternative works. However the developer offered a substantial contribution to the cost of works with the proviso that erosion should be arrested before further significant loss of land occurred. Consequently the work was scheduled for 2008-09. The developer also had real concerns over the safety issue.

The proposed works would result in the river being held securely in its new alignment by means of a heavy rock lining. The developer would then stabilise the cliff by lowering the ground at the top of the cliff, and flattening the slope. It would then be technically acceptable to remove the building line restriction.

The rough order of cost estimate for the work was \$2.5 million, of which the estimated cost to the Lower Manawatu Scheme would be \$1.5 million, and that sum was included in the approved project budget of \$11.5 million. The developer has confirmed a contribution of \$1 million, subject to the removal of the building line restriction. However the \$2.5 million estimate has subsequently been revised upwards, for reasons set out below.

### 4. Investigations and Design To Date

A preliminary design concept has been prepared, with the design alignment being finalised. The realigned river would be held on its new alignment by armouring the river bank on the outside of the bend using a heavy rock lining similar to the rock lining at Dittmer Drive. Rock linings such as this performed very well during the major flood of February 2004.

Site investigations have been carried out. Test drilling in November 2007 investigated ground conditions that would be encountered in the deep excavation for the new river channel. Four bore-holes were drilled, and they identified a layer of uncemented, erodible sandy material at a relatively shallow depth. Some of the proposed new channel excavation would extend over three metres down into the sandy material. The erosive action of the river on the sandy material could undermine the rock lining if preventative measures were not undertaken.

Another issue emerged in January 2008. After the river has been realigned, the developer intends to remove material from the top of the cliff, and place that material as fill adjacent to the new left (south) bank of the river. The fill will be very high and therefore heavy, so the strength and other properties of the underlying material need to be known.

The developer's consultant therefore drilled two more test bores to the south of the new river alignment. That drilling was taken to a greater depth than the

HRC bores. Each bore-hole encountered an aquifer with water under significant artesian pressure. Although the drilling sites were not within the area of the proposed new channel excavation, they were close enough to identify a potentially serious risk.

At present the artesian aquifer is typically 15 to 18 metres below the ground surface, and the pressure of that depth of gravel and sand exceeds the water pressure in the aquifer. However the excavation for the new river channel will have to be 7 to 10 metres deep. In the lower areas of the excavation, the artesian water pressure would exceed the ground pressure.

The worst case scenario is that the sandy material at the base of the excavation would be lifted up by the water pressure, and would break up. This is known as a “ground-heave failure”. The water in the aquifer would no longer be confined. If the aquifer is too porous, water could flow rapidly into the excavation, filling the excavation completely and turning the base into an unworkable slurry.

The extent of the high pressure areas of the aquifer needed to be established, so in February 2008 Council approved the expenditure needed to drill four further bore-holes in the proposed excavation area. Three of the bore-holes subsequently drilled encountered artesian water pressures high enough to be a problem. It therefore has to be assumed that all or most of the excavation area could be subject to the artesian water pressure problem.

## **5. Prevention of Problems due to Artesian Pressures and Erosion of Sand**

The risk of the rock lining being undermined by erosion of the sandy material will be countered by placing rock armouring on a 30 metre wide strip of riverbed adjacent to the rock lining. Where the sandy material is encountered more than 30 metres from the rock lining, it will not be armoured, and it will not be excavated. The river will be allowed to carry the sandy material away during subsequent floods. At the same time as the river scours the sand away, it will carry gravel into the newly aligned reach of river. Sand and gravel will initially mix, and eventually a stable layer of gravel will form over the scoured-down sand. Test pits and bore-holes show that this has already happened in some places as part of natural river processes.

Two responses to the artesian pressure problem have been considered:

- Install relief wells to drain water out of the aquifer and reduce its pressure; and
- Carry out the deeper excavations under water.

The second alternative is preferred, it is seen as more reliable, and probably less costly. Most of the excavation can be carried out in the dry, but before excavation proceeds below a predetermined critical level, the excavation will be partially flooded, and all further excavation will take place under water. The weight of the water in the excavation will help to counter the artesian pressures, and eliminate the risk of a ground-heave failure.

## 6. Cost Estimate Increases

A large proportion of the project cost is due to the bulk earthworks required in excavating a new channel, stockpiling, and backfilling the old channel. The cost of such large scale earthworks has increased considerably in recent years. This has been verified by industry sources. The costs for supply and cartage of rock has similarly increased.

Taking into account the increased cost of earthworks, the need to prevent erosion of the sandy material in the new riverbed, and the need to undertake part of the excavation under water, the revised rough order of cost estimate is \$4.2 million. It should be noted that estimating the cost of projects such as this is difficult because for a period of time the work will be vulnerable to large floods in the river. A contingency sum of \$400,000 has been allowed, and that includes provision to repair damage caused by floods. More likely than not it will be sufficient, - the Fitzroy Bend realignment was completed without incurring river damage costs. There is however a real possibility that the contingency sum will not be large enough.

## 7. Alternatives to Realigning the River

Council has budgeted \$1.5 million as its share of the river realignment project. If the project is to proceed this sum will need to increase to \$3.2 million unless other funding sources can be found. At this point it is worth considering other alternatives. A range of lesser alternatives is discussed below, with Table 1 presenting a comparison of the options:

**Do nothing:** This is not acceptable. The problems described above in the “Anzac Cliff Building Line” section of this report would not be addressed. The river would continue to erode the cliff. Eventually it would develop a very unfavourable alignment, causing the river to attack the riverbank on the city side of the river adjacent to the Manawatu Golf Course. Eventually, although it might not happen for a very long time, the stopbank protecting the city would be threatened. In the meantime the identified real risk to life arising from a cliff collapse will remain.

**Do minimum:** Also not acceptable. It would mean doing nothing until poor alignment caused the river to attack the riverbank at the Golf Course. At that time any necessary protection work to ensure the security of the stopbank could be carried out on the city side of the river. This has already been considered, and the decision made that it is not enough. The issue of the continuously retreating cliff would not be addressed, and this problem is too serious to ignore.

**Stabilise the river close to its existing alignment:** This is a less costly way of limiting the retreat of the cliff, and could be done for \$2.3 million. The retreat of the cliff would eventually be halted, but a number of years might elapse before confidence about the cliff edge location was sufficient to allow the building line restriction to be lifted. Accordingly it is unlikely that any contribution for the developer would be forthcoming

The public safety issue would be addressed, but not quite as promptly as with the \$4.2 million project.

## 8. Stabilising the River Close to its Existing Alignment

A gravel embankment would be constructed in the river parallel to the cliff, and far enough out from the toe of the cliff to eliminate risks due to debris falling from the cliff during construction. The river side of the embankment would have a rock lining placed against it, and would eventually become the new riverbank. Gravel for the embankment would be taken from the beach near the river. The space between the embankment and the cliff would eventually fill up with material falling off the cliff. It would be desirable to fully or partly fill the space with gravel from the beach, and that will be done if a safe method can be found.

The river needs to be turned through an angle of 110 degrees as it flows in from the upstream reach and turns to flow parallel to the cliff. A curved length of gravel embankment and rock lining will be needed upstream of the cliff to facilitate this change in direction.

The cost of the gravel embankment and rock lining is estimated at \$2.3 million. This is considerably less than the \$3.2 million that would be Council's share of the realignment proposal discussed to date, but is rather more than the budgeted \$1.5 million. A \$1.5 million job could be carried out, but would be rather less robust than the \$2.3 million job, and would carry a significant and probably unacceptable risk of failure.

This proposal would eventually halt the retreat of the cliff. It would not stop immediately, but erosion of the cliff's toe by the river would be slowed right down. The cliff would reshape itself to a flatter, more secure slope that could eventually be vegetated. Alternatively the cliff could be battered back and vegetated immediately to at least partially mitigate the risk of collapse. Once the cliff appeared to be stable, the location of the building line could be reconsidered.

## 9. Timing

The \$4.2 million project has a degree of urgency, because the developer's \$1million share is only available on the basis that the work should be done soon, before too much land is lost. The \$2.3 million project probably does not offer enough to the developer to merit a contribution, so it is much less urgent. The developer might however see value in making a lesser contribution in return for the works being given increased priority.

Pre-2004, the cliff was retreating at about one metre per year, and although it has been faster in the past few years, the rate of retreat will probably slow down soon until there is another very large flood. Postponing work for a few years would not create difficulties from the river management or construction points of view.

The safety issue will remain until the cliff retreat has been stabilised, and the cliff vegetated. As residential development proceeds, the population near the cliff will increase, with its associated risk to people, and particularly children, exploring the area near the cliff.



Table 1. COMPARISON OF RESPONSES TO THE ANZAC CLIFF RETREAT PROBLEM

Issue	Option:	<i>Do nothing</i>	<i>Do minimum</i>	<i>\$2.3 million river realignment</i>	<i>\$4.2 million river realignment</i>
Construction cost to HRC		None	Up to \$500,000 in the long term.	\$2.3 million	\$3.2 million
River alignment		Will be allowed to deteriorate. Erosion will eventually occur on opposite bank.	Will be allowed to deteriorate. Erosion will eventually occur on opposite bank.	Will not be allowed to deteriorate, but will not be improved.	New river alignment will be stable and easy to manage.
Flood protection for city		Threat to city because poorly aligned river will eventually undermine stopbank near Golf Course.	City not threatened because protective rock lining will be constructed when needed.	Risk of downstream bank erosion considerably reduced but not eliminated. A small risk of need for works to protect city in the long term.	Threat removed. Good alignment will eliminate need for rock lining at Golf Course.
Public safety		No improvement to public safety.	No improvement to public safety.	Public Safety will be improved, once the cliff has stabilised, which could take longer than the \$4.2 million project.	Public Safety will be improved, once the cliff has been stabilised.
Cliff retreat		Not addressed	Not addressed	Will be halted once cliff has stabilised, likely to be well before building line comes under threat.	Will be halted once project has been completed.
Ability to develop prime land near top of cliff		None. Building line will remain in place, and in the very long term will have to be retreated.	None. Building line will remain in place, and in the very long term will have to be retreated.	Some relaxation of the building line likely to be acceptable once the cliff has stabilised	Building line could be removed once the project has been completed.



A Significant decision? <b>If Yes</b>	No
Do recommendations meet Significance Policy (contained within the LTCCP)	

**Item No: 7**  
**Date: 15/10/2008**  
**Report No: 08-182**  
**File No: PRD 4 03**

## **KING'S CANAL OVERFLOWS IN FOXTON**

### **PURPOSE**

1. This report is to inform Members about an investigation carried out on recent overflows from "King's Canal" in Foxton.

### **FINANCIAL IMPACT**

2. There would be a minor impact on Scheme rates to fund recommended additional inspections and improved maintenance arising from recommendations in this item.

### **BACKGROUND**

3. King's Canal diverts rural stormwater around Foxton and along Purcell Street into the Foxton Loop of the Manawatu River. This diversion drain is the main drainage channel in the Foxton East Drainage Scheme.
4. A Scheme Review was completed in 2006 and recommended minor upgrade works to provide 50-100 year flood protection from overflows into Foxton.
5. Prior to the Review there had been several occasions when the channel overflowed and contributed to the surface flooding in the town, but this was largely attributed to poor maintenance, culvert blockages and lowered stopbanking rather than excess flows and insufficient channel capacity.
6. As noted in the Review, the last time houses were flooded was on 28 September 2004 when the channel was flowing close to full capacity and obstructed by the unauthorised installation of corrugated iron fencing across the drain at Cook Street.
7. This flooding produced extensive surface flooding in the Cook Street area, with flooding of several dwellings in Johnston Street (main highway) and Gladstone Road. A contributing factor was the limited capacity of the stormwater system, which has subsequently been improved locally by the addition of a manhole grill on a stormwater main (by Horowhenua District Council).

### **OVERFLOWS SINCE THE REVIEW**

8. Since the Review there have been two more occasions when King's Canal has overflowed, once in Cook Street on Saturday evening, 11 August 2007, and once in Purcell Street around midnight on Wednesday 23 July 2008 (see Photo Plan in Annex A).
9. The Cook Street event also involved overflows through the Coley Street School due to the undersized culvert at Coley Street that was due for replacement.
10. Both cases involved channel blockages and emergency works to relieve the situation but only the Cook Street overflow was associated with heavy rainfall and the channel flowing fairly full. The peak four hour rainfall was about 32 mm for this two-to five-year rainfall event. Run-off was quite high due to the fairly saturated catchment after 65 mm in the previous two weeks.

11. In the Purcell Street case the channel was only about half full after relatively light rain. The peak four hour rainfall was about 17 mm, which is much less than the two-year rainfall of 27.8 mm. Run-off would have been reasonably high after 76 mm in the previous two weeks.
12. In neither case were any dwellings flooded, but the overflow in August 2007 flooded the sheds and garage in the property next to the channel at 82 Cook Street to a depth of about 400 mm. The ponded water then overflowed at a shallow depth down the driveway into Cook Street, but this minor flow would not have contributed significantly to the extensive surface flooding in the lower Cook Street areas. Such flooding typically occurs from local run-off due to limited stormwater infrastructure in Foxton, where the sandy country generally provides adequate soakage in normal rainfall.
13. The overflow in upper Purcell Street caused surface flooding of properties as it flowed along the street towards the highway, but there was no significant damage. After the flow receded, the culvert was found to be blocked by windblown polystyrene packaging from the adjacent chicken factory.
14. The overflow in August 2007 occurred 50 m downstream of Cook Street where a willow tree had fallen across the drain. This was the first time there had been any overflow problems on this property. Although the channel was flowing close to full capacity, it is unclear why water levels were so high and whether the overflows were caused by the fallen willow, blockage further downstream, sand build-up in the bed of the channel or a combination of these factors.
15. Survey has confirmed that the low stopbanking where the tree fell over is about 300 mm higher than the adjacent backyard and 150 mm lower than the driveway where the ponded water overflowed into Cook Street.
16. To avoid a repeat of this overflow it would therefore be necessary to raise the stopbanking at least 200 mm. Further survey would be required to confirm the amount of work involved to top up the whole 100 m length of existing banking, but it is likely to be relatively small.
17. The Scheme review identified this 100 m of stopbanking downstream of Cook Street for possible future upgrade if required. There had been no problem of overflows in the past so no survey was done of this length, but analysis indicated that there was little freeboard to ground level at the design flow.
18. Further inspection confirmed that there was existing low stopbanking that appeared to provide adequate protection against overflows into the adjacent property and in addition there was higher ground around the property boundary that effectively provided backup protection to limit overflows into town. This approach was confirmed by the event last year, when water ponded in the backyard and the driveway only just overflowed into Cook Street.

#### **SUMMARY OF RECOMMENDED AND COMPLETED WORKS**

19. The Review recommended minor works to replace an undersized culvert at Coley Street and improve low stopbanking between Cook Street and Coley Street.
20. The stopbanking was subsequently upgraded early in 2007, and the culvert was replaced early in 2008. The new stopbanking prevented overflows in the August 2007 event but there was very little freeboard. The culvert upgrade should prevent recurrence of the minor overflows that have occurred across the school grounds.

21. More substantial works were not considered necessary and would have the potential to increase flooding east of King's Canal and direct more flow into the lower end of Purcell Street where it could unduly exacerbate the ponding problems there.
22. The recommended works allowed any risk of overflows to be fairly evenly spread through the urbanised sub-catchments between the sandhills that are intercepted by King's Canal.

## **CONCLUSIONS**

23. The overflows that have occurred in recent years have almost certainly been caused by blockages or other maintenance related issues.
24. The present Scheme is able to provide 50-100 year level of protection, but as recommended in the Review it does require a relatively high level of maintenance to better suit the urban environment.
25. The recommendations of the Scheme Review 2006 are generally appropriate to ensure adequate channel capacity for King's Canal because there is:
  - a relatively low risk of flood damage from overflows;
  - ready emergency response to clear blockages and mitigate overflows;
  - limited justification for additional costly upgrades;
  - potentially greater flooding of property east of Cook Street if stopbanking is raised to provide more freeboard; and
  - potentially greater flooding of industrial and commercial properties in lower Purcell Street if more flow is diverted.

## **RECOMMENDED ACTIONS**

26. The recommended actions listed below generally elaborate on the scope of works recommended in the Review, particularly with respect to improved maintenance. They are intended to maintain the design channel capacity and minimise the potential for blockages.
27. They also highlight the need for more comprehensive recording and reporting of flood events to be carried out at the time.
28. Topping up the banking downstream of Cook Street provides little benefit to Foxtan but is a prudent measure that can readily be carried out during routine machine cleaning for little cost. It would also help prevent future ponding on the adjacent property at 82 Cook Street.
  - Top up the 100 m of low banking downstream of Cook Street with drain cleanings to raise the level 150-300 mm (to be confirmed by detailed survey and design).
  - Remove or trim the existing trees growing along the edge of King's Canal between Avenue Road and Nye Street, especially the willows along the boundary fence at 82 Cook Street.
  - Regularly clean out sand buildup in the bed of the channel in the vicinity of Cook Street (where there is a change of gradient and cross section).

- Promptly remove and repair any slumping to maintain channel capacity and alignment.
  - Place scour protection at culvert outlets where required to fill scour holes and minimise material being carried to slower flowing reaches downstream (particularly to address existing problems at Avenue Road and Union Street).
  - More frequent inspections of King's Canal to check for obstructions, and more regular machine cleaning and weed control (full inspections to be undertaken monthly).
  - Liaise with the owners of the chicken factory in Purcell Street to ensure that appropriate measures are taken to prevent polystyrene blocking the drain.
  - Report on flood events in a more accurate and comprehensive manner to allow more informed analysis and decision-making. Record water levels at key sites (eg. Spring Street, Avenue Road, Cook Street, Union Street, Purcell Street); carry out channel inspections during and immediately after the event to identify obstructions and remedial works.
29. There will obviously be cost implications arising from the increased frequency of inspections and monitoring, however this is considered justified in view of the urban environment, the potential for blockages, and the potentially serious consequences.

## RECOMMENDATIONS

30. That the Committee recommends that Council:
- a. **receives** and **notes** the information in Report No. 08-182;
  - b. **notes** the actions to be taken in ensuring a higher standard of maintenance for King's Canal; and
  - c. **notes** that any associated increase in Scheme costs would be met by the Foxton East Drainage Scheme ratepayers in Foxton (U1 rates).

W T Wheeler  
**DESIGN ENGINEER**

A D Cook  
**GROUP MANAGER OPERATIONS**

## ANNEX

A Photo Plan

Photo Plan - King's Canal Overflows – Foxton East Drainage Scheme





A Significant decision? <b>If Yes</b>	No
Do recommendations meet Significance Policy and LGA requirements?	

**Item No: 8**  
**Date: 15/10/2008**  
**Report No: 08-180**  
**File No: PRD 4 08**

## **MAKERUA DRAINAGE SCHEME: SPIERS - KINGSTON CAPITAL WORKS**

### **PURPOSE**

1. The purpose of this item is to update the Committee on issues relating to proposed capital expenditure within the Makerua Drainage Scheme and associated rating concerns raised by ratepayers.

### **FINANCIAL IMPACT**

2. Funding provision for the capital works discussed in this item is included in the 2008-09 Annual Plan. Adoption of the recommendations would result in a relatively minor reduction in both Scheme and general rates requirements for the current year.

### **BACKGROUND**

3. In June 2006 a meeting was held with owners of properties to the south-east of the Opiki-Shannon intersection, within the Makerua Drainage Scheme. At this meeting it was agreed that the culvert under the State Highway needed to be lowered in order to address a long-standing problem and to provide an adequate standard of drainage to the properties concerned.
4. David Napier and Associates were engaged to design a culvert that would satisfy the particular local drainage requirements and would also comply with the New Zealand Transport Agency's (NZTA) specifications.
5. A final design for the culvert was approved by NZTA in June 2007.
6. While consulting with MWH as NZTA's representatives, the opportunity arose to combine the culvert upgrade with proposed State Highway 57 realignment works immediately north of the culvert location.
7. MWH were then engaged to provide an estimate for the upgrading of the culvert and to identify possible cost savings that could be achieved by combining that work with the proposed highway realignment. The culvert upgrade was estimated to cost \$140,320.00 and potential savings of \$12,000 were identified in the areas of traffic control and pavement reinstatement, if the work was included as a schedule item in the highway works contract. The net estimated cost was therefore \$128,320.00.
8. The culvert upgrade item was then included in the highway contract documents although the ability to remove the item if necessary from the contract schedule by way of variation was retained.
9. In early 2008 public tenders were called by MWH for the highway realignment contract, including the culvert replacement item. Very competitive tenders were received and the culvert upgrade item was priced at \$80,000.
10. The issue of the culvert upgrade was discussed at the Annual Scheme meeting. It was recognised that much of the land that would benefit from the upgrade was not presently being rated by the Scheme. It was also noted that a review of the Scheme rating system,

primarily to address anomalies in the south-eastern part of the Scheme catchment area, was scheduled for 2008-09. It was recognised that the review would provide the opportunity to fairly apportion costs of the culvert upgrade. However, any changes arising from the review could not be implemented until 2009-10, and the opportunity to achieve very significant savings through incorporating the work within the highway contract would by then be lost.

11. Ultimately it was agreed that the work should proceed and be funded by borrowing. Loan repayments were to be funded through the appropriate capital works rating category, until an amended rating system was in place. Budget provision for the \$80,000 expenditure and for the required level of loan funding was made in the 2008-09 Annual Plan accordingly.

### **Rating Impact of the proposed works**

12. The present rating system in the Makerua Drainage Scheme is set up such that any loans taken out are funded solely through capital improvements rates collected from the catchment area in which the works are undertaken. No indirect benefit rates are applied to the capital rating categories. In this instance, the culvert upgrade falls within the Speirs/Kingston/Makerua East catchment and loan repayments must be met from the associated rating category.
13. The new loan drawdown was added to an existing loan balance relating to earlier capital works undertaken in the same rating area. That loan had a remaining term of eight years and that term was not increased when the new drawdown was added. Consequently, the principal repayments for the new loan were very high and the impact on rates for the category concerned was dramatic. In fact rates for the Speirs/Kingston/Makerua East category increased from \$17.67 per hectare to \$65.69 per hectare.

### **Consultation**

14. The very significant impact of the new loan should have been recognised and the affected ratepayers consulted accordingly. Unfortunately that did not occur.
15. Affected ratepayers contacted staff and Councillors when they received their 2008-09 rate demands. The situation was made worse by the fact that those ratepayers would not receive direct benefit from the culvert upgrade.
16. The Speirs/Kingston/Makerua East pump catchments are included in one rating area that includes a narrow strip comprising approximately 36 hectares of land on the eastern side of the State Highway. That land is rated at the same level as the greater area of land in the category, which is to the west of the highway, despite the fact that it receives a lower level of drainage service on account of the elevated road culvert. The area to the east of the highway has for some years been assisting with the funding of capital works that only benefit land to the west of the highway. Accordingly there is some justification for the whole rating area to now assist with the culvert upgrade.
17. A meeting was held with all the ratepayers concerned on 24 September 2008 where the above points were discussed and understood. The following approach was ultimately agreed by all present:
  - that the upgrading of the culvert should proceed during the current year as programmed;
  - that the loan term be increased from eight years to 20 years; and
  - that until the rating system review is completed, only interest payments should be made. Principal payments should commence once a fair apportionment of benefits and costs has been determined through the reclassification.

18. At present only 216 hectares is being rated for benefit from drainage and pumping services in the Spiers/Kingston/Makerua East area, although there is a total catchment area of 624 hectares.
19. It is therefore anticipated that the costs of the culvert upgrade can be spread in a manner that will substantially reduce the rating impact referred to above. Property owners who will receive direct benefit from the work, but are not presently rated in the Scheme, have indicated their support for the proposed rating review.
20. In the meantime it is proposed to refund part of the capital rate struck this year in respect of the five properties concerned. The revised rate will be approximately \$25.50 per hectare.
21. General rate requirement for the Scheme will reduce by approximately \$1,500 as a consequence of deferring principal repayments.

## RECOMMENDATIONS

22. That the Committee recommends that Council:
  - a. **receives** the information contained in Report No. 08-180;
  - b. **supports** the culvert upgrade work proceeding in the current year;
  - c. **approves** the increase of the loan term in respect of the upgrade costs from eight to 20 years; and
  - d. **approves** the repayment of loan interest only for the 2008-09 year and the refund of rates as a consequence.

J Foxall  
AREA ENGINEER SOUTHERN

A D Cook  
GROUP MANAGER OPERATIONS



A Significant decision? <b>If Yes</b>	No
Do recommendations meet Significance Policy and LGA requirements?	

**Item No: 9**  
**Date: 15/10/2008**  
**Report No: 08-181**  
**File No: PRD 4 08**

## **MAKERUA DRAINAGE SCHEME: MANGAORE PUMPSTATION**

### **PURPOSE**

1. The purpose of this item is to seek the Committee's and ultimately Council's approval for the purchase of a new flood pump for the Mangaore pump station in the Makerua Drainage Scheme.

### **FINANCIAL IMPACT**

2. There is no funding provision in the 2008-09 Annual Plan for the capital expenditure proposed in this item. Approval of the item would commit Scheme and general ratepayers to annual rates of approximately \$5,300 and \$1,300 respectively, for the next 20 years.

### **BACKGROUND**

3. In July 2008 the main flood pump at the Mangaore Pumpstation failed after the drive shaft broke.
4. The pump was withdrawn and sent to MacEwan's in Auckland for assessment and possible repair.
5. The failure has subsequently been attributed to bearing failure which in turn appeared to have resulted from all lubricant having been washed out of the bearing housing.
6. The main flood pump in question is a Vickers-Gill Boothmac pump of age 40 years plus. This type of pump does not have any gland packing to protect the bearing. Instead it depends on the pump being unable to generate sufficient head to raise the water up to the bearing height. However it appears that a modification undertaken at some time in the past has allowed water to rise further in the housing than originally designed.
7. The assessment has also revealed that the pump in its present location is operating below its lowest effective pumping level, resulting in cavitation, associated impeller and housing wear, and increased maintenance costs.
8. The estimated cost of shaft replacement and modification to overcome the bearing problem is \$12,000 plus GST.

### **REPLACEMENT OPTION**

9. A new pump, designed to meet the present site specific pumping requirements at the Mangaore site, would cost \$55,000 plus GST. Minor pump chamber modifications are estimated to cost another \$5,000.

### **CONSULTATION**

10. A meeting of all four ratepayers in the Mangaore pump station rateable area was held on 1 October 2008. The repair or replacement options, together with various funding options, were discussed.

11. The unanimous view of those present was:

- That the existing pump be replaced with a new MacEwans PPF 15/18 fitted with a C-0 impeller and 22 kw motor.
- That repairs and modifications to the existing pump be undertaken, excluding the replacement of the impeller, and that the pump then be retained by the Scheme for either temporary or permanent use in another pump station. Despite the age of the pump, it is a very common model and was substantially rebuilt eight years ago. The proposed repairs and modifications would return it to good condition and to current specifications.
- That the \$60,000 purchase and installation costs associated with a new pump be loan funded.

### FUNDING IMPACTS

12. It is proposed that repairs to the existing pump be a charge against the current maintenance budget and that the replacement pump be funded by a 20-year term loan, with repayments to be funded by the Mangaore pump station benefit area.
13. The four land owners who would be rated for repayment of the loan have signed letters requesting that a new pump be purchased and acknowledging the associated rating impacts.
14. Since there is no budget provision in the 2008-09 Annual Plan for this capital expenditure, and therefore no rates being collected to service a loan, it is proposed that both principal and interest payments be deferred until 2009-10. In that case there would then be no additional General Rate contribution to the Scheme during the current year.

### RECOMMENDATIONS

15. That the Committee recommends that Council:
- a. **receives** the information contained in Report No. 08-181;
  - b. **approves** the purchase of a new pump for the Mangaore pumpstation;
  - c. **approves** a loan of \$60,000 to be repaid over a term of 20 years; and
  - d. **agrees** that loan repayments to be deferred until 2009-10.

J Foxall  
AREA ENGINEER SOUTHERN

A D Cook  
GROUP MANAGER OPERATIONS

A Significant decision? <b>If Yes</b>	N
Do recommendations meet Significance Policy and LGA requirements?	

**Item No: 10**  
**Date: 15/10/2008**  
**Report No: 08-176**  
**File No: ELM 6 00**

## **SUSTAINABLE LAND USE INITIATIVE (SLUI)**

### **PURPOSE**

1. This report is to update members on progress for the implementation of the Sustainable Land Use Initiative (SLUI).

### **FINANCIAL IMPACT**

2. There is no financial impact associated with recommendations in this paper.

### **PROGRESS TOWARDS TARGET**

3. Confirmed 80 WFP to be completed by June 2009, 75% of these by LandVision Ltd.
4. As at end of September LandVision has mapped 17 properties and forwarded ten to Horizons. Soil Suitability Assessments has mapped one property.
5. Four Whole Farm Plans (WFP) have been completed and of these one has been presented to the farmer.
6. Around 107 of the 126 WFP completed to date have started or intend to start their works programmes this year. As the last of the 2007-08 plans are delivered to farmers these programmes are being reconfirmed.
7. Eight claims have been forwarded for works to date this year, involving \$55,000 of grant.
8. Joint venture planting has been completed and release spraying is now underway.

### **ACTIVITY SUMMARY**

9. A SLUI Advisory Group meeting was held on 23 September. The group reaffirmed its wish to continue and to be seen as a sounding board to provide advice to Council.
10. Draft agreements for the loan/forestry right agreements have been provided to all five customers in the process this year. Negotiations around specific clauses etc are ongoing.
11. A spreadsheet to manage priority assessment is continually updated for proposed farm plans. A priority list has been prepared for the 80 WFP to be produced in 2008-09. This list has targeted 60 plans in high priority catchment areas and 20 over the hill country at large. LandVision is well through mapping on a list of 19 properties for the first quarter of this financial year. The second quarter names and information has been provided to LandVision also.
12. The spreadsheet currently has 61 landowners within the priority catchments confirming they want a WFP. We also have another landowner from outside the priority areas on a waiting list. We will need to be clear to these landowners that they may be waiting 12 to 18 months for a plan.

13. Work is continuing in a number of technical areas around SLUI, including development of a database to track and record progress on plans and physical works, (this database is currently installed and being tested on our system), developing a number of case studies around Carbon Emissions Trading Scheme options for landowners, planning for a joint Australia New Zealand Societies of Soil Science field trip into our SLUI hill country in December.
14. Carbon seminars are still proposed but after discussion with the SLUI Advisory Group it was decided February / March would be an appropriate time to hold them.
15. The SLUI contract is with the Ministry of Agriculture & Forestry (MAF) for signing. MAF has indicated it wants to include a clause around carbon. We are yet to formally discuss this with MAF.
16. MAF recently provided a Memorandum of Understanding (MOU) to Regional Councils for the uptake of funds (\$25 million over 10 years) for the Afforestation Grants Scheme (AGS). Members will recall details of Governments original AGS intentions whereby 50% of the funds approved by Cabinet would be assigned to Regional Council in support of afforestation on land that delivered multiple benefits. SLUI is clearly a target for such funding where co-benefits are so evident. The Assessment Panel for the AGS is chaired by Andrew Newman (Chief Executive Hawkes Bay Regional Council), and the first assessment meeting has been called for 21 October 2008. Horizons' Chief Executive is a member of this assessment panel.
17. The AGS has allocated \$2.8 million into this financial year. Horizons are in the process of making four applications to this fund covering approximately 500 ha of joint venture forestry planted to date. The application will be for between \$1,100 and \$1,800 per hectare.
18. Central Government recently passed legislation dealing with an Emission Trading Scheme (ETS). Reportedly over 700 amendments were made to the Bill and we are yet to see the impact of these changes, if any. Unfortunately 'carbon' seminars have been taken a back seat until after the general election. The ongoing uncertainty around the ETS does cause issues when trying to implement SLUI as farmers prefer to take a wait and see approach as to the best option for them. We continue to get mixed messages on what is, and what is not covered, in both the ETS and AGS schemes.

## RECOMMENDATIONS

19. That the committee recommends that Council:
  - a. **receives** the information in Report No. 08-176.

G Cooper  
**ENVIRONMENTAL MANAGER - LAND**





11-15 Victoria Avenue  
Private Bag 11 025  
Manawatu Mail Centre  
Palmerston North 4442

T 0508 800 800  
F 06 952 2929  
help@horizons.govt.nz  
www.horizons.govt.nz