

**THE WEST COAST REGIONAL COUNCIL**

**TARAMAKAU RIVER RATING DISTRICT**

**ASSET MANAGEMENT PLAN**

October 2014

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## **EXECUTIVE SUMMARY**

Under the Local Government Act 2002 Councils are required to develop 'Asset Management Plans' to demonstrate that they are managing the infrastructure for which they have responsibility.

This plan sets out the history of the scheme so there is a record of the major decisions, including expenditure. It identifies the Objective(s) of the scheme as well as the methods of monitoring the condition of the assets, and determining the annual maintenance needed to retain the service level.

The Taramakau Scheme covers that area of the right bank of the Taramakau River generally known as the Taramakau Settlement. The rating area covers approximately 8 kilometres of river frontage.

The area protected is predominantly dairy farming with some dry stock. Community infrastructure such as roads, power and telephone lines all derive benefit from the river control system.

The Infrastructural Asset Register details all of the Scheme's assets and their latest valuation.

## **SECTION 1: INTRODUCTION**

### **1.1 PURPOSE OF AN ASSET MANAGEMENT PLAN**

This Asset Management Plan defines the objective and performance standards of the Taramakau Rating District river scheme for which the Regional Council has the maintenance responsibility. It also provides a basis upon which the effectiveness of maintenance performance can be measured.

This asset management plan:

- Identifies the service level for the Rating District.
- Describes the history of the rating district and identifies its assets.
- Describes the methods used to maintain the service level of these assets.
- Complies with the regulatory requirements of the Local Government Act 2002.

### **1.2 BACKGROUND**

The Taramakau Settlement was opened up after World War II in 1949. There were 9 settlers on dairy farms contributing to works and each of these farms had a river frontage and suffered serious erosion prior to the construction of the groyne (stone-basket strongpoint) built in mid 1940 (Langridges hook groyne). A total of 2,640 tonnes of rock riprap was placed in 1949. The strongpoint however, was still in a dangerous state. Floods in June and October 1949 further damaged the groyne. An estimate of \$5,130 was proposed for the supply of 2,400 tonnes of rock.

The total area protected was 1,500 hectares with a capital value of \$27,730.

In May 1950 a stopbank (50 metres in length) built behind the strongpoint was destroyed. This bank prevented flood overflows from taking an old course along the settlement frontage.

In 1952 an estimate was prepared to repair 1 downstream farm frontage (A length of 200 lineal metres).

A report completed on 21 January 1955 indicated works involved 24,647m<sup>3</sup> on stopbanking, and 2,300 tonnes of rock were required to protect the uppermost areas of the district.

Widespread flooding on 26 and 27 December 1958 caused extensive damage and required a reappraisal of bank heights in the Taramakau area.

In 1960 NZ Soil Conservation and River Controls Council was approached to fund works (i.e. 1,000 tonnes of rock) to top up the main groyne.

The Taramakau Settlement Separate Rating area was first proposed by the Westland Catchment Board on 10 April 1962. The first rates were struck on 22 July 1962. The rates were based on an area basis.

In October 1968, the bottom property (Shaw) underwent erosion. A proposal to build a rail and willow retard 1,080 metres long was estimated to cost \$6,400.

On 16 August 1972 a report was sent to the Commissioner of Works. This report outlined an overall protection scheme for the Taramakau River between Pugh's Hook and the bottom gorge. This scheme had been discussed with all farmers on both the left and right banks. The agreement, in principal included stopbanking, hook groynes, and riprap protection. The estimated total cost of the overall scheme was \$284,000.

The first works proposed involved 5,000 tonnes of rock rip rap, 10,300<sup>3</sup> of stopbanking and opening up a new quarry.

On 22 May 1972, the Taramakau River was in danger of breaking through the bank. Urgent repairs were carried out – (\$16,000). At a meeting of farmers and Westland Catchment Board representatives it was resolved to produce an overall scheme proposal as soon as possible.

In February 1977, 2700 tonnes of rock was utilised on the top section of the stopbank (Langridge/Gluyas). This was placed as rip rap.

In 1977 a revised scheme covering 12.2 kilometres from the Pugh and McGrath Hook at Turiwhate to the bottom of the Taramakau Settlement was estimated at \$360,000. The scheme was designed to provide flood protection for a 50 year return period flood. The flood design discharge was 4,400 cumecs. The stopbanks were designed to have a freeboard of 0.900 metre above the design flood level.

The proposed works included:

- i. 7.3 kilometres of stopbanking on the right bank – 250,000m<sup>3</sup>
- ii. 5 new rock retards
- iii. rock rip rap along both banks

In 1978, 3,297 tonnes of rock was utilised on Langridge's and Templeton's properties.

In 1980, 1,540 tonnes was placed in the same area.

On 24 December 1981 the NZ Soil Conservation and Rivers Control Council approved funding for the Taramakau River Scheme at an estimated cost of \$846,000 with a 70% subsidy rate. Work had to commence by December 1983. The Scheme work was carried out over a 10 year period.

A classification was presented to ratepayers on 17 February 1983 and adopted by the Westland Catchment Board on 28 May 1984.

On 20 August 1985 the major works on the Taramakau Scheme were completed. This major contract involved 120,400m<sup>3</sup> of stopbanking, and 21,126 tonnes of rock (total cost \$255,740).

The Westland Catchment Board purchased Milson's Island from Colin Stewart on 5 June 1985 for \$380.00. This was gazetted on 17 April 1986. This land was purchased to allow the small overflow diversion to be constructed through the property.

At the ratepayers' request, a new classification was promulgated and adopted by the West Coast Regional Council on 18 May 1993.

It is an area based maintenance and capital rating district.

### 1.3 DESCRIPTION OF ASSETS

The Rating District assets consist of all those works outlined in the Infrastructural Asset Register. The total replacement value of these works is 8.375M as at June 2014.

<b>Asset Class</b>	<b>Value</b>
Rock	\$3,448,159
Fill	\$3,768,990
Rubble	\$122,932
Bridges	\$20,000
Culverts	\$26,260
Stockpile	\$75,705
Excavation	\$3,000
Contingencies & Administration	910,735
<b>TOTAL</b>	<b>\$8,375,782</b>

The capital value of land and buildings within the confines of the scheme is \$19.5M.

### 1.4 MAINTENANCE EXPENDITURE

Appendix I shows expenditure since 1986. The average annual expenditure is \$72,379.

### 1.5 EXISTING STANDARD

Cross-section and flood flow analysis undertaken for the Taramakau scheme indicates that approximately 70% of the main stopbanks are not capable of containing 4,100 cumecs, which is the 2008 estimate of the 1 in 50 year return period flood with 900mm freeboard. The rating district has accepted that there is a need to increase the level of protection and are considering raising its height in the medium to long term.

## **2. SCHEME PERFORMANCE**

### **2.1 OBJECTIVE**

The objective of the Taramakau Rating District is to reduce bank erosion and flooding along the upper and lower sectors of the Taramakau River Scheme.

Cross-section and flood flow analysis undertaken for the Taramakau scheme indicates that approximately 70% of the main stopbanks are not capable of containing 4,100 cumecs, which is the 2008 estimate of the 1 in 50 year return period flood with 900mm freeboard. The rating district has accepted that there is a need to increase the level of protection afforded by the stopbank and are considering raising its height in the medium to long term.

### **2.2 MAINTENANCE PROGRAMME**

An annual maintenance programme will be prepared each year in consultation with the ratepayer committee prior to adoption by the Council for inclusion in the Annual Plan.

In preparing the annual maintenance programme consideration will be given to:

- works requiring immediate repair.
- works anticipated as being required given a 'normal' season.
- flexibility to meet unbudgeted damages.

An annual report will be presented to the Rating District outlining the condition of the scheme assets and maintenance works and expenditure required for the coming financial year.

#### **Stopbanks**

Stopbanks are man made structures generally running parallel to the flow of the river that are built to raise the bank level and hence increase the capacity of the river. They are usually constructed of compacted river gravels with a grass cover and do not have the strength to resist the erosive forces of a river in flood without adequate bank protection works in place.

Maintenance includes repair of any scouring, vegetation removal to facilitate access, control of stock to prevent damage to stopbank batter slopes, topping up of stopbanks as required to maintain stopbank capacity in terms of design.

Stopbanks can potentially be damaged by:

- (i) Failure of a training groyne such as a rock retard which can allow the full force of the river to suddenly run along a relatively unprotected stopbank, and cause scouring of stopbanks in excess of 50 metres in length
- (ii) Overtopping: Stopbanks are generally not designed to sustain overtopping. They may however be capable of sustaining minor overtopping for a short duration in flows not exceeding 100mm in depth over the top of the bank. Overtopping of durations greater than an hour may scour the back batter resulting in failure of the structure, it is therefore important to ensure there is an even and strong vegetation cover on the landward batter.

- (iii) Piping: Flow through porous bank or foundation material can wash out fines leading to a collapse.
- (iv) Stock and Vehicles: Can remove cover and wear ruts in surface resulting in weakness.
- (v) Construction: Construction of pipelines cables under stopbanks as well as holes on top of stopbanks can weaken the structure. Drainage channels should not be located at the toe of stopbanks.
- (vi) Earthquake: Stopbanks can be damaged in the event of an earthquake by cracking vertical or horizontal displacement, or by liquefaction of the foundation material.

**Erosion Control Works**

Erosion control works consist of rock placed in continuous riprap, spur groynes, stub groynes, strongheads, hook groynes, and in river training retards. They are built to provide protection to stopbanks from erosive forces during floods by training the river into a stable pattern or to reduce velocities along stopbanks using stub rock groynes.

Erosion control structures are the areas with the major exposure to damage. The meander of a river can change significantly by floods of only moderate duration. This can result in an acute angle of attack of protection structures resulting in damage which is disproportional to the flood discharge.

It is very important to ensure damage to bank protection structures is undertaken swiftly and to ensure:

- Rock training walls are kept to the required height to lessen failure.
- Any slumping of rock off strongpoints, spur groynes and rip rap are topped up.
- Rock is of a durable nature, angular and of the correct grading size.

**2.3 DAMAGE EXPOSURE**

River control works are constructed in a very high energy environment with the purpose of resisting and absorbing some of that energy. It is considered that no matter what the standard of maintenance carried, it is inevitable that damage will occur to structures.

An assessment of maximum damage potential was derived from estimating the damage ratios and costs for three flood events and is in vicinity of \$1,560,000.

<u>FLOOD EVENT SIZE</u>	<u>VALUE</u>	<u>DAMAGE RATIO</u>	<u>DAMAGE EXPOSURE</u>
20 Year	\$8,375,782	10%	\$ 837,578
100 Year	\$8,375,782	20%	\$1,675,156
500 Year	\$8,375,782	20%	\$1,675,156

## **SECTION 3: FUNDING**

### **3.1 Maintenance**

Maintenance is funded by targeted rates, the level of rating being determined each year in the Annual Plan process following:

- Preparation of an annual works programme and corresponding budget.
- Consultation with Rating District.
- Adoption of draft programme and budget by Council.
- Adoption of final Annual Plan by Council.

### **3.2 Damage Repairs**

Routine damage repairs are funded by a combination of:

- carrying out work as scheduled in annual works programme.
- reprioritising works identified in the annual works programme.
- use of financial reserves.

Major damage repairs would be funded by loans raised by the Council and repaid by targeted rating over a number of years.

### **3.3 Financial Reserves**

Financial reserves are held within each rating districts account to provide the following.

- meet the costs of unscheduled works.
- enable an immediate response to flood damage repairs.
- prevent major fluctuation in rating levels annually.

The level of financial reserves held in each rating account is determined by the assessment of risk damage and the need for unprogrammed works.

### **3.4 Depreciation**

Rating District schemes are designed to be maintained in perpetuity by constantly repairing and replacing component parts which are damaged by the constant wear and tear. Because there is a constant cycle of replacement of elements of the infrastructure, depreciation of the value of the assets is not appropriate and funding of depreciation is not necessary. This approach is consistent with the NZ Infrastructure Asset Valuation and Depreciation Guidelines (Section 5.4.4).

## **SECTION 4: PERFORMANCE MEASURES**

The overall performance measure is that the infrastructure assets are maintained to meet their service levels at all times.

The following procedures will be adopted to ensure the adequacy of maintenance.

### Annually

- (i) Produce annual works report for the rating district to include type of work to be undertaken, quantities, location and costs.
- (ii) Organise contracts for agreed scheme work, oversee contract completion and report to Council.
- (iii) Report on works undertaken during the previous financial period to the rating district ratepayers and Council.

### Performance Measure

No reports of stopbanks or erosion protection works requiring repairs without an agreed programme of remedial work in progress.

### Triennially

- (i) Re-fly aerial photographs of the area, analysing these photographs to assess changes in river meander patterns that could impact on Rating District Assets.
- (ii) Re-measure cross section river profiles to determine whether the riverbed is stable, or aggrading, and to identify management issues or options.
- (iii) Revaluation of the asset schedule to include any additional rock placed on stopbanks and bank protection works over the three year period.
- (iv) Review this Asset Management Plan

### Performance Measure

Report to Council and ratepayers on revaluation of assets and the Plan review.

## APPENDIX 1: EXPENDITURE FROM 1986

<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
130,589	10,087	58,336	138,056	154,902	37,789	50,380	34,286
<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
19,980	83,214	21,898	47,083	9,269	70,562	44,010	2,596
<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
55,900	2,572	25,061	52,480	362,567	48,853	160,658	14,710
<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>			
89,309	137,139	91,643	118,087	26,990			

Total Expenditure \$ 2,099,006

Average Expenditure \$ 72,379

Average Expenditure as a % of Asset Value 0.86%

As at 30 June 2014, the value of the Taramakau Rating District Scheme assets is \$8,375,782