

## **Crown Pastoral Land Tenure Review**

**Lease name : Mt OLYMPUS**

**Lease number : PC 050**

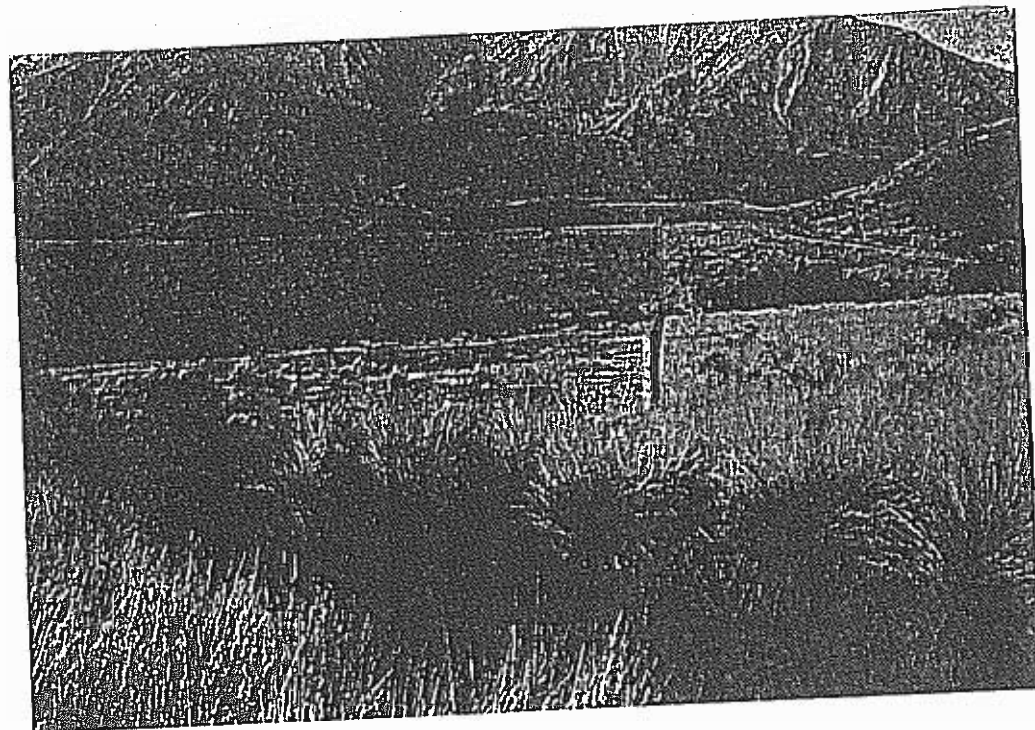
### **Due Diligence Report (including Status Report) - Part 5**

This report and attachments results from a pre-Tenure Review assessment of the pastoral lease for the purpose of confirming land available for Tenure Review and any issues, rights or obligations attaching to it. The information is gathered from files and other sources available to the LINZ contractor.

Part of the information relates to research on the status of the land, resulting in a Status Report that is signed off by a LINZ approving officer. The remainder of the information is not analysed for relevancy or possible action until required, and LINZ does not guarantee its accuracy or completeness as presented.

The report attached is released under the Official Information Act 1982.

**July 09**



STREAMBANK VEGETATION ALONG HENNAH STREAM

#### 2.7.2 Wildlife

A wide variety of aquatic or semi-aquatic bird species are known to dwell in or on the lakes and/or wetlands on Ryton Station. These birds include ducks and other waterfowl along with waders, shags, a bittern and a rare native grebe.

Waterfowl recorded on these lakes include the native grey duck, paradise shelduck, N.Z. Scaup and Shoveller along with introduced species including the mallard, black swan and Canada goose.

Waders noted or near at least some of these lakes include the spur-winged plover, the native banded dotterel and the common, endemic South Island pied oystercatcher. Both black shags and common shags have been recorded from Lake Evelyn. Australasian Bittern, a fairly uncommon native species, have been located in the wetlands adjacent to Lake Evelyn, and they are also probably present in the Henrietta and Moss Burn wetlands.

The rare, native southern crested grebe, (the total N.Z. population was estimated at 240 - 250 birds in 1980) has been recorded from Lakes Selfe, Henrietta and Catherine and is also likely to be present at times on Lake Evelyn. Crested grebes are entirely aquatic birds which attach their nests to emergent lake vegetation during the November - January breeding season, a period during which it is important that they are not excessively disturbed.

A survey of these lakes carried out by the Wildlife Service in 1978 suggested that:

- (a) Lakes Evelyn and Catherine and their associated wetlands are of high and moderate-high value to wildlife respectively;

- (b) Lakes Ida and Henrietta, and the latter's associated wetland, are of moderate value to wildlife; and
- (c) Lake Selfe is of little value to wildlife.

Reference for Sections 2.6 and 2.7: B. Cowie, Resource Division N.C.C.B. The Rakaia River and Catchment: A Resource Survey, Volume 3, N.C.C.B., 1983.

### 2.8 Management

Stock numbers as at 1/7/84

<u>No.</u>	<u>Merino Sheep</u>	<u>Stock Units</u>
7200	mixed age wethers	5040
	Total Sheep 7200	

Overall carrying capacity 0.55 s.u./ha

#### Stock Management

The owners intend to implement a programme of rotational grazing and mob stocking over much of the property. The older wethers will rotationally graze the Goldney, Knuckles, Harper terrace and Monk fan blocks during the autumn, winter and early spring. Following shearing in mid-October they will be placed on the lower lake side of Cottons Central and Cottons South before moving to the Little Ida and Clay Range over the summer. The young wethers will be rotationally grazed around Cottons North, Harper flats and Cotton Central from the autumn until shearing. Following shearing the rotation will be repeated and include Cottons South and Peninsula blocks.

The owners aim at increasing the present stock numbers to 10000 wethers when the development programme is completed. The development programme includes the grant assisted works, 1066 hectares of oversowing and topdressing and approximately 15 kilometres of additional fencing. One thousand additional stock units are planned for 1985.

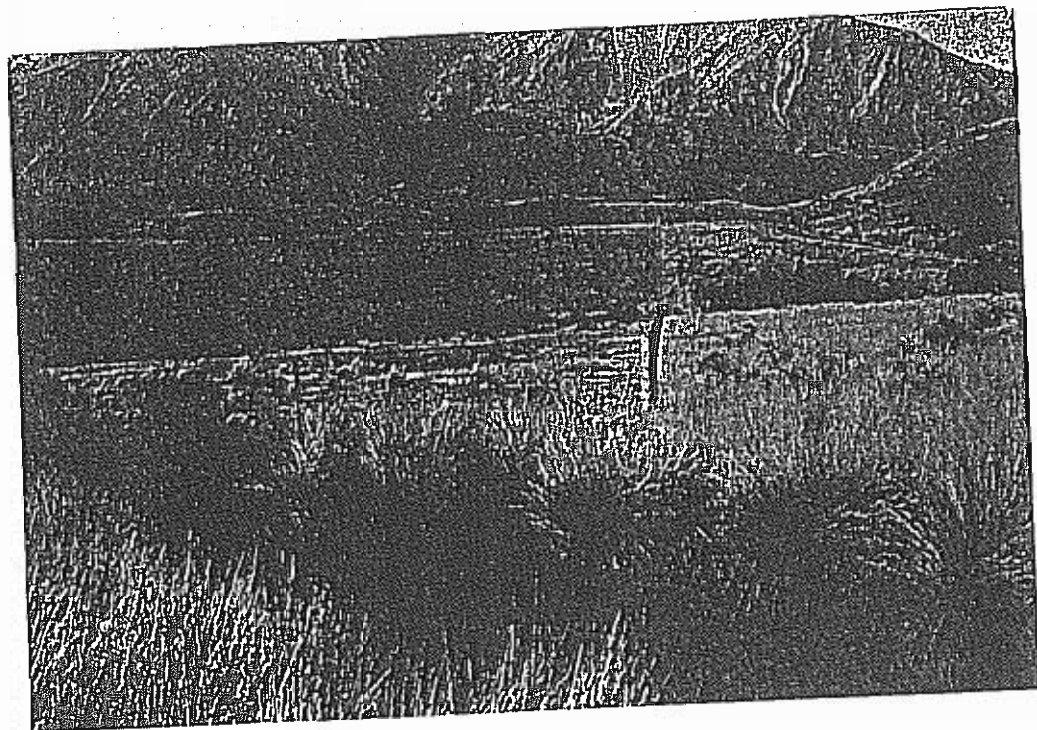
### 3. THE SOIL AND WATER CONSERVATION PLAN

#### 3.1 Aims and Objectives

- (a) To decrease stock grazing of the higher and more eroded land.
- (b) Identifying and improving for off-site benefit, the better classes of farmland.
- (c) The use of fencing as a means of improving the vegetative cover.
- (d) The protection of the arable areas through the establishment of windbreaks.
- (e) To encourage changes, through the co-operation of the runholders, in the management of certain areas so that the water and fisheries resource and the intrinsic character of the area are maintained as much as possible in their natural state.

#### 3.2 Conservation Problems and Proposals

Ryton Station comprises many facets of soil and water. It contains high mountainous land where slopes in excess of 30° erode readily, low windswept hills and terraces, shallow fans and deeper soils within the valley floors and wetland margins. Within the matrix of landforms there exist a number of lakes and associated wetlands from which numerous small streams flow.



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3.2.1 Retirement of Severely Eroded Lands

Ryton Station is held under three titles; freehold, University leasehold and Crown Pastoral lease. The latter except for 45 hectares of river flats consists of steep mountainous land that is sparsely vegetated and predominantly Class VII and Class VIII land. 6136 hectares has been retired from stock grazing under a previous S.W.C.P. plan No. 35 for the then property Lake Coleridge. This was made up of 5013 hectares Crown Pastoral Lease and 394 hectares University lease.

On the University leasehold areas of the property there is some severely eroded Class VIII mountainous land and associated Class VII land that is land with little or no pastoral value. The vegetative cover is sparse and unable at such altitudes to support the dual role of watershed protection and grazing animals.

PROPOSAL A - RETIREMENT FENCE MT IDA

It is recommended for grant assistance to retire from stock grazing 1510 hectares of the Mt Ida block by using 1.2 kilometres of existing fencing and the erection of 10 kilometres of new fences.



MT IDA

The fencing will be completed over three stages and of significance is the inclusion of Lake Henrietta and an associated wetland into the retired area.

In regard to the Class V, VI, VII and Class VIII land stock displaced has been calculated as follows:

Class	Area (ha)	Extent of Grazing	Stock Units Displaced
V	42	4 per ha	168
VI	55	2 su. per ha	110
VII	284	1 su. per 5 ha	57
VIII	1136	1 su. per 20 ha	57
	<hr/> 1508		<hr/> 392

PROPOSAL B - RETIREMENT FENCE MT HENNAH

It is recommended for grant assistance to retire from stock grazing 190 hectares of Mt. Hennah. This will be achieved by the use of a natural barrier, 0.8 kilometres of existing fence and the erection of 4 kilometres of new fencing.

It is not anticipated that this area will be retired until development at either end of the Cotton' block is well advanced.

In regard to the Class VI, VII and VIII land stock displaced have been calculated as follows:

Class	Area (ha)	Extent of Grazing	Stock Units Displaced
VI	20	2 su. per ha	40
VII	48	1 su. per 5 ha	9.6
VIII	122	1 su. per 20 ha	6.1
	<hr/>		<hr/>
	190		say 56

The proprietors have agreed to accept option (a) of Section 5.2 (Destocking) of the N.W.A.S.C.O. Hill and High Country policy on retirement. Option (a) provides for Land Improvement Agreement specifying the conditions of destocking to be registered against the title but does not include the need to surrender the title.

Terms and Conditions

Conditions: (a) refrain from grazing stock on the retired land; and  
(b) refrain from carrying out any other uses of the retired land that may be detrimental to the interests of soil and water conservation such interests to be assessed by the Board on the basis of accepted and prudent soil and water conservation practice.

Term: 99 years with a review of the conditions by both parties at the expiry of thirty three (33) years from the completion of the works and thereafter at intervals of eleven (11) years. As a result of any such review the conditions relating to grazing of the retired land may only be varied by mutual agreement between the parties.

PROPOSAL C - STOCK LIMITATION CENTRAL COTTONS BLOCK

Of the areas to deal with on this property the Central Cottons block (or Sheep range) is the most difficult. It contains a significant area of Class VII and Class VIII land. It is lower in altitude than the Mt Ida block and the vegetative cover is not so sparse overall.

To completely retire from stock grazing the Class VII and Class VIII lands would require a fence at a higher altitude. This fence would be subject to snow damage particularly on the shady aspect and require numerous flood gates to cross the many 'gullies' originating from the summit. To site a retirement line at a lower and more manageable level would exclude a significant proportion of grazing land.

It is recommended for grant assistance to erect an 11 kilometre soil conservation fence and to have a stock limitation on that area above the fence.

The stock limitation will be for 200 stock units per annum. The area will generally be grazed from mid May until mid September. This will coincide to a large extent with snow being on the top of the range and thus prevent stock grazing the higher and more eroded areas. Provision shall be made in the land improvement agreement for emergency grazing of this area in times outside the stated period but shall be subject to a written request made to the Board and on any terms or conditions the Board may impose. Projects SCF 67.

### 3.2.2 Off-Site Benefit

In order to achieve the retirement of the eroded land it will be necessary to develop the better classes of country to increase the available feed for relocated stock. In the plan this will be achieved through oversowing, topdressing and associated fencing for stock control. The development of oversown and topdressed blocks as part of the off-site benefit has been sited away from several lakes in order to minimise the risk of fertilisers directly or indirectly entering the lakes system that could result in a change to the nutrient level of the lakes.

Where fencing has been used for off-site benefit its contribution has been calculated on the equivalent average per stock unit cost in providing off-site through oversowing and topdressing.

#### PROPOSAL D - OVERSOWING AND TOPDRESSING

It is recommended for grant assistance to fence and oversow and topdress 60 hectares in the North Cottons block as part of the off-site work. The topdressing will be a spilt application. 375 kg/ha will be applied at time of oversowing and 250 kg/ha applied 12 months later. 1.6 kilometres of fencing is required. This is estimated to provide sufficient off-site benefit for 120 stock units at a cost of \$107.00 per stock unit.

Projects OSTD 1 pt 1 & 2 and OSTD fencing.

#### PROPOSAL E - OFF-SITE BENEFIT FENCING

It is recommended for grant assistance to erect 7 fences as part of the off-site benefit. The fences amount to 9.4 kilometres of which 2.6 kilometres are electric. This has been estimated to provide 328 stock units of off-site the equivalent of oversowing and topdressing 164 hectares.

Projects O.B.F. 1 - 7.

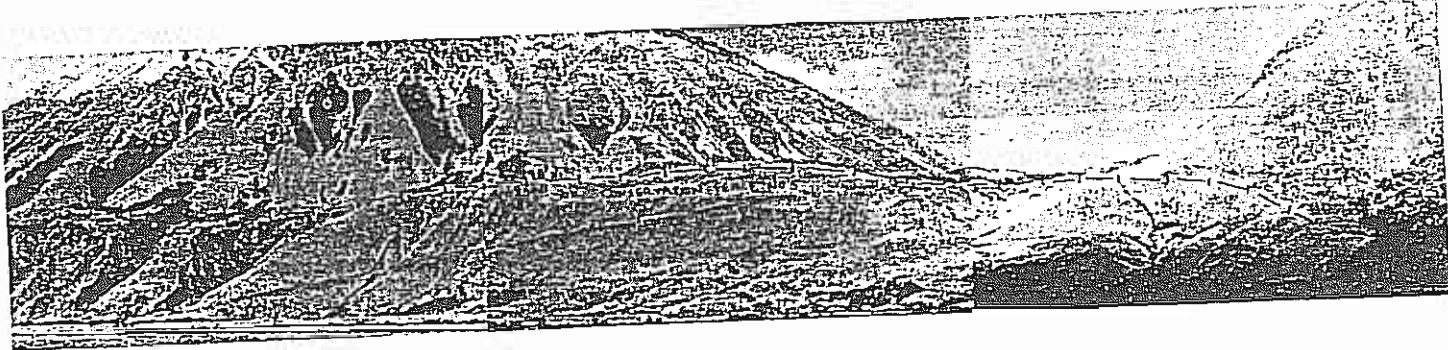
### 3.2.3 Soil Conservation Fencing

In the past the Ryton Station has been the summer country for the Lake Coleridge run with either end of the Cottons block also doubling for winter grazing. This meant that blocks were often fenced for size and as a consequence the more eroded and less productive land could be grazed in the same way as the more productive land.

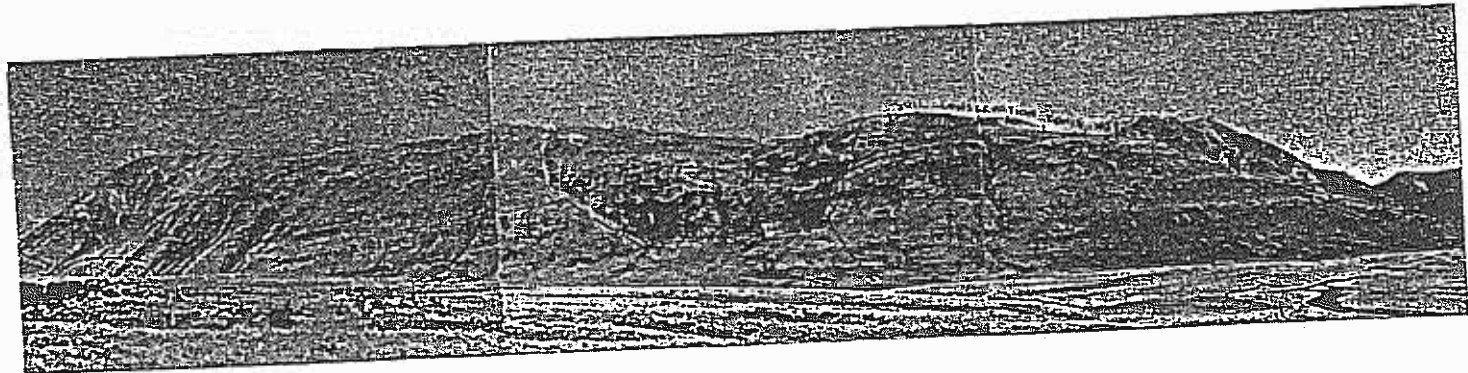
With recent subdivision and the change to a more intensive land use it is important to control the grazing over the eroded land.



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FENCING - CLAY RANGE



FENCING - COTTONS SHEEP RANGE

### PROPOSAL - SOIL CONSERVATION FENCING

It is recommended to establish 5 soil conservation fences totalling 17 kilometres on the property.

#### Cottons Block

Top Cottons: Two fences. The first a ridge fence of 3000 metres and the other a mid slope fence of 2500 metres is required to fence out a block of higher altitude and more eroded Class VII land from adequate Class VI land that will allow a stock limitation to be placed on the higher and more eroded Class VII land.

Bottom Cottons: Two fences. The first fence of 2 kilometres is a ridge fence separating the sunny Class VI land of the Carriagex Drive from the shady more eroded Class VII land. The second fence of 1.5 kilometres serves to separate the Class VII land from a fan that slopes towards Lake Coleridge which contains both arable and non-arable land.

Clay Range: This fence is 8 kilometres long. It extends from an existing fence along the Ryton River northwards towards the confluence of the Harper and Avoca Rivers before turning 90° and extending along a high terrace above the Harper River flats to meet the existing retirement line. This fence will separate the windswept, badly sheet eroded and predominantly Class VII land of the Clay Range from the less eroded river flats, terraces, fan and low hills between the former and Mt Ida.

#### 3.2.4 Windbreak Treeplanting

Often the long-term development of high country runs depends upon the amount of arable land. On this property there is a relatively small area suited to arable use and wind erosion is an ever present hazard. These areas are generally cultivated and used to produce supplementary winter feed. They require continuous protection by good land management practices and well-sited windbreaks.

### PROPOSAL - WINDBREAKING TREEPLANTING

It is recommended for grant assistance to establish 1500 metres of trees in 2 windbreak lines.

### 3.3 Future Management

A change in the management of the property is envisaged once the fencing has been completed. A more intensive land use involving rotational grazing is planned. For future management of retired lands refer to Section 3.2.1 Retirement of Severely Eroded Lands. The fencing planned within the top and bottom Cottons blocks will allow controlled limited grazing over the Class VII land. Blocks A and B will have stocking limitations of 65 and 125 stock units per annum respectively and generally grazed between mid November and mid February allowing time for a vegetative cover to establish before the winter.

Block C (the Clay Range) will be used over the late summer period.

Block D (Central Cottons) will have a stock limitation of 200 stock units per annum and be generally grazed between mid June and mid September when there will be a snow cap on the higher parts of the block.

The objective of the soil conservation fencing and restricted grazing is to ensure a vegetative cover on those parts of the property where frost lift and subsequent wind blow is a problem.

### 3.4 Environmental Impacts

Ryton Station contains areas of outstanding natural beauty. The principal area being a corridor between the Cottons Range and Mt Ida block containing several lakes and associated wetlands the most significant of which is Lake Selfe.

The impact of this plan is principally visual. A number of lines will be bulldozed prior to erecting fences and likely to create a negative visual effect. The oversowing and topdressing of blocks is likely to render this effect as temporary. Elsewhere fences will remain largely unnoticed situated as they are at the toe slopes of ranges.

Any impact on the lakes is likely to be negligible. Much of the oversowing and topdressing is on areas outside lake catchments.

The windbreak treeplanting proposals are located on the Peninsula and Cottons South fan and as such will not intrude upon the visual corridors of the area.

### 3.5 Economic Aspects

The proposed soil and water conservation plan forms the basis of the property's development programme and as such the owners' inputs cannot be divorced from the economic evaluation. The economic analysis for the total development plan indicates an internal rate of return around 17%. This is reduced to 5.5% when the base production from capital stock, their initial cost and associated costs of buildings are excluded from the analysis to give a more realistic comparison with other similar properties.

## 4. SPECIFICATIONS

### 4.1 Fencing

<u>Specifications:</u>	Conventional	3 treated wooden posts per 20 metres 8 x 2.5 mm high tensil wires Strainer assemblies, permanent wire strainers, tie backs and tie downs as required
	Electric	1 Insul-timber permanent post every 30 metres 4 Insul-timber droppers between 5 x 2.5 mm high tensile strainer posts intermediate posts and tie downs as required
<u>Costs:</u>	Conventional	\$4100.00 per kilometre
	Electric	\$2800.00 per kilcmetre

#### 4.2 Oversowing and Topdressing

Specifications: Initial Application 375 kg/ha sulphur super  
3 kg/ha "Grasslands Ilua" whiteclover  
1 kg/ha "Grasslands turoa" redclover  
1 kg/ha "Grasslands apanui" cocksfoot

Followup Application 250 kg/ha superphosphate

Costs: \$140.00 per hectare

#### 4.3 Windbreaking Treeplanting

Specifications: Fence 3 treated wooden posts per 20 metres  
2 spring wire droppers between posts  
8 x 2.5 mm high tensile wires  
Strainer posts, stays and permanent wire  
strainers as required

Trees Stocks: 1 rows 18 month old Douglas fir  
2 rows 18 month old Pinus radiata

Spacings Trees within a row 2.5 metres  
Between rows of trees 3.0 metres  
Between outer row and fence 2 metres

Land Preparation The tree lines to be ripped with a suitable  
implement at least twice during early  
autumn. Following ripping the lines to be  
spot sprayed, 1 metre in diameter, 4 - 6  
weeks prior to planting.

Costs: \$4000 per kilometre established.

RYTON STATION

Type of Work	Project No.	Quantity	Unit Cost and Contingencies	Job Cost	Subsidy Rate	Local Share	Subsidy	Local Share	Subsidy to Farmer
<u>Year One</u>									
Soil Conservation Fence	S.C.F. 2	2500 metres	\$4100/km	10250	60%	4100	6150	1025	5125
Soil Conservation Fence	O.B.F. 6	2000 metres	\$4100/km	8200	60%	3280	4920	820	4100
Soil Conservation Fence	S.C.F. 3	2000 metres	\$4100/km	8200	60%	3280	4920	820	4100
Soil Conservation Fence	S.C.F. 4	1200 metres	\$4100/km	4920	60%	1958	2952	492	2460
Soil Conservation Fence	S.C.F. 5	8000 metres	\$4100/km	32800	60%	13120	19680	3280	16400
Oversowing and Topdressing	CSTD 1	60 hectares	\$95/ha	5700	70%	1710	3990	427	3563
Associated Fencing	CSTD Fence	1600 metres	\$2200/km	4400	70%	1344	3136	336	2800
Off-site Benefit Fencing	O.B.F. 1	600 metres	\$4100/km	2460	70%	916	1722	229	1493
Off-site Benefit Fencing	O.B.F. 2	1300 metres	\$4100/km	5330	70%	1599	3731	400	3331
Off-site Benefit Fencing	O.B.F. 4	1700 metres	\$2300/km	4760	70%	1428	3332	357	2975
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Off-site Benefit Fencing	O.B.F. 5	400 metres	\$4100/km	1640	70%	492	1148	123	525
				83740		23239	55681		
		Service Charge 35%		22185		8310	13920		
				110925		41549	69501		
<u>Year Two</u>									
Soil Conservation Fence	S.C.F. 1	3000 metres	\$4100/km	12300	60%	4920	7380	1230	6150
Retirement Fence	R.F. pt. 1	3200 metres	\$4100/km	13120	70%	3936	9184	984	8200
Off-site Benefit Fencing	O.B.F. 3	900 metres	\$2300/km	2520	70%	756	1764	189	1575
Off-site Benefit Fencing	O.B.F. 7	2500 metres	\$4100/km	10250	75%	3075	7175	769	6406
Soil Conservation Fencing	S.C.F. 6	5400 metres	\$2800/km	15120	65%	6048	9072	1512	7560
Windbreak Treeplanting	T.P. 1	700 metres	\$4.00/m	2800	60%	1120	1680	280	1400
Follow-up Topdressing	O.S.T.D. 1	60 hectares	\$45/ha	2700	70%	810	1890	202	1688
				58810		20665	38145		
		Service Charge 25%		14702		5166	9536		
				73512		25831	47681		

Type of Work	Project No.	Quantity	Unit Cost and Contingencies	Job Cost	Subsidy Rate	Local Share	Subsidy	Local Share to Service Charge	Subsidy to Farmer Charge
<u>Year Three</u>									
Retirement Fencing	R.F1 pt 2	3200 metres	\$4100/km	13120	70%	3936	9184	984	8200
Windbreak Treeplanting	T.P. 2	800 metres	\$4.00/m	3200	60%	1280	1920	320	1600
Soil Conservation Fence	S.C.F. 7	5600 metres	\$2600/km	15680	60%	6272	9408	1568	7840
				<u>32000</u>		<u>11488</u>	<u>20512</u>		
		Service Charge 25%		8000		2870	5128		
				<u>40000</u>		<u>14358</u>	<u>25640</u>		
<u>Year Four</u>									
Retirement Fence	R.F1 pt 2	3200 metres	\$4100/km	13120	70%	3936	9184	984	8200
		Service Charge 25%		3280		984	2296		
				<u>16400</u>		<u>4920</u>	<u>11480</u>		
<u>Year Five</u>									
Retirement Fence	R.F. 2	3600 metres	\$4100/km	14760	70%	4428	10332	1107	9225
		Service Charge 25%		3690		1107	2583		
				<u>18450</u>		<u>5535</u>	<u>12915</u>		
<u>SUMMARY</u>									
Year One				88740		33239	55681		
Year Two				58910		20665	38145		
Year Three				32000		11488	20512		
Year Four				13120		3936	9184		
Year Five				14760		4428	10332		
				<u>207430</u>		<u>73756</u>	<u>133854</u>		
		Service Charge 25%		51857		18439	33463		
				<u>259287</u>		<u>92195</u>	<u>167317</u>		

APPENDIX 2

PREVIOUS WORKS

The following works have been carried out on Ryton Station under the former Coleridge run Soil and Water Conservation Plan No. 35.

Job Type	Year	Length/ Area	Rate of Grant	Actual Job Cost	Subsidy Claimed
Retirement Fence		19.98 km	Total	20677	21179
Cattle Proofing		12.23 km	1:1	4114	1940
Soil Conservation Fencing		11 km	1:1	10107	4245
Oversowing and Topdressing	1974	121 km	1:1	2316	973
Firebreak Access Track	1973	2.4 km	1:1	729	243
River Work					
TOTAL				37943	28580

Two Soil Conservation fences (6.4 km) were erected in 1959 prior to S.W.C.P. No. 35

APPENDIX 4

ECONOMIC ANALYSIS - RYTON STATION

Compiled by F.J. McGuigan,  
SOIL CONSERVATOR.

The objective of this report is to identify the economic benefits to the nation of the proposed soil and water conservation works to be carried out on the property.

The soil and water conservation plan forms the core to the development programme that is envisaged and for this reason cannot be separated from the remaining farm development works. Conversely, any costs associated with setting up of the farm development must be a cost associated with the conservation plan.

INTRODUCTION

Ryton Station was recently purchased as a block of 'bare land'. Formally part of the Lake Coleridge run it contains a matrix of landforms held under three separate tenures.

Conditions are cold in winter with severe frosts and snow to low levels. In the spring and summer the property is buffered by north-west winds. Traditionally the property has been used for extensive pastoralism.

Under the Lake Coleridge soil and water conservation plan some 6136 hectares of this property have been retired from stock grazing.



PROPOSED PROGRAMME

The development programme involves the retirement from all grazing of 1698 hectares of Class VIII and erosion-prone Class VII of the Mt Ida and Mt Henna blocks by the erection of 14 kilometres of fencing. Included in the retired area is a lake and associated wetland. Retirement, although of significance, is not the most important immediate feature, but instead the fencing, oversowing and topdressing. The total programme involves the erection of 53.5 kilometres of fencing (39 km grant assisted) and the oversowing and topdressing of 1130 hectares (60 hectares grant assisted). Of this, 60 hectares of oversowing and topdressing and 11 kilometres of fencing are to provide the necessary off-site for the stock displaced.

The balance of the programme involves the erection of 1500 metres of windbreaks, the construction of a homestead and farm buildings, and purchase of general farm equipment. The necessary machinery and labour resources are already present.

The blocks involving oversowing and topdressing at present have a cover of either silver or fescue tussock, browntop, sweet vernal, yorkshire fog with some matagouri scrub. The following is a summary of the proposed agricultural production expected as a result of the oversowing and topdressing:

BLOCK	AREA (HA)	CURRENT CARRYING CAPACITY STOCK UNITS PER HECTARE	IMMEDIATE IMPROVEMENT WITH O.S.T.D.	ESTIMATED ULTIMATE POTENTIAL WITH ROTATIONAL GRAZING
Ryton Fan	202	1.00	3.00	4.00
North Cottons	224	1.95	3.85	5.00
Carriage Drive	100	1.26	3.26	4.50
Harper Flats	400	1.40	3.40	4.80
Top Harper Flats	202	1.20	3.00	3.80

The expected stock increases as a result of the development programme are as follows:-  
RELEASED UNDER THE OFFICIAL INFORMATION ACT

EXPECTED INCREASE IN STOCK UNITS PER YEAR

1984/85

Part North Cotton	60 ha at 2 s.u./ha	120	
Carriage Drive	100 ha at 2 s.u./ha	200	
			300

1985/86

Ryton Fan	202 ha at 2 s.u./ha	404	404
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1986/87

North Cottons	164 ha at 2 s.u./ha	328	
Part Harper Flats	200 ha at 2 s.u./ha	400	
			728

1987/88

Part Harper Flats	200 ha at 2 s.u./ha	400	400
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1988/89

Top Harper Flats	202 ha at 1.8 s.u./ha	364	364
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2,216

STOCKING

the property was purchased as bare land and as such the production base was nil. The purchase of the capital stock and erection of the necessary buildings is in theory a direct cost to the plan. Conversely the base production and not merely the increment in production, drawn from these stock would in theory also be a benefit to the plan.

It is considered that to claim the full production from the capital stock initially brought and to include capital items such as homestead as a true cost to the plan would unduly weight the analysis. For this reason both the initial stock purchase cost (\$236,580), the buildings (\$113,500), general farm equipment (\$5,000) and the immediate production benefits (\$21.94 per stock unit) whose inclusion showed an internal rate of return of 15.7% have, although itemised, been excluded from the final analysis.

It is the owners' intention to operate a five year flock, buying replacements in the sixth year. These purchases will be in addition to those increases contemplated for the oversowing and topdressing.

COSTS

The tangible and intangible costs have been identified in the plan.

- Tangible - the primary tangible costs are shown as the initial capital expenditure and the maintenance costs
- the secondary tangible cost is in the form of 1/2 labour unit that will be drawn from another property which will result in an increased contractual cost to that property.

Capital Costs of Development

<u>Conservation Plan</u>	<u>1984/85</u>	<u>1985/86</u>	<u>1986/87</u>	<u>1987/88</u>	<u>1988/89</u>	<u>1989/90</u>	<u>1990/91</u>	<u>1991/92</u>
Fencing (retirement)	-	16400	16400	16400	18450	-	-	-
Fencing (soil con.)	70212	34275	19600	-	-	-	-	-
Fencing (off-site)	33947	15962	-	-	-	-	-	-
Oversowing & Topdressing	7125	3375	-	-	-	-	-	-
O.S.T.D. Associated								
Fencing	5600	-	-	-	-	-	-	-
Windbreak Tree Planting	-	3500	4000	-	-	-	-	-
<u>Other Farm Development</u>								
Oversowing & Topdressing	12825	25265	40345	33805	28100	9090	-	-
Fencing	35260	16400	8200	-	-	-	-	-
Tracking	3150	1260	-	-	-	-	-	-
Farm Buildings								
- Homestead	-	-	(50000)	-	-	-	-	-
- Woolshed - Yards	(30500)	-	-	-	-	-	-	-
- Shearers Quarters	(23000)	-	-	-	-	-	-	-
General Farm Equipment	(3000)	(2000)	-	-	-	-	-	-

Stock

Capital Purchases at \$47/s.u.	15040	18988	34216	18900	17108	-	-	-
(Initial stock 236,580) - refer section Benefits								
Total Capital	183159	135425	122761	69005	63748	9090	-	-

MAINTENANCE COSTS

In order to maintain the developed blocks it will be necessary to apply 188 kg/ha every second year. Using a cost of \$145 per tonne applied, every second year the yearly cost of fertiliser is \$13.63 per hectare developed. The maintenance cost of fertiliser is:

1984/85	-
1985/86	-
1986/87	2181
1987/88	4934
1988/89	9895
1989/90	12621
1990/91	15374

In order to maintain the wether flock numbers it will be necessary to buy in replacements. It is estimated that numbers required for replacement will remain constant at 1450 stock units after 10 years. The average replacement cost for 1984 is \$32.00 and the selling value of cull merino \$22.00 per head. The net replacement of stock is:

1984/85	-
1985/86	-
1986/87	2856
1987/88	4284
1988/89	4284
1989/90	15508
1990/91	16565
1991/92	18535
1992/93	19678
1993/94	20706

BENEFITS

Tangible -

the immediate benefits to be derived from this plan will be the increased agricultural production as a result of more controlled grazing and mob stocking that fencing will allow. The oversowing and topdressing will further increase the carrying capacity resulting in additional output.

It has been estimated that the nett revenue from each additional stock unit carried is equivalent to \$23.67 per year.

However, not only will the programme result in the property carrying more stock, but the present stock will achieve improved per head performance. In accounting for seasonal conditions, improvement management and nutritional plane the writer considers that an increase in wool weights of 0.3 kg per head (3.2 kg/head to 3.5 kg/head) is possible as a result of the proposed programme. The increase is likely to be a gradual increment and related to the fertiliser programme.

There is a small benefit in the form of labour expenses to be made resulting from the retirement. It is estimated that three man days per annum or a saving of \$250 will be made annually.

Intangible - there are three major benefits that will arise as a result of the proposed plan, to which it is difficult to quantify in monetary terms:

(a) Conservation Values -

1. The prevention of further on-site erosion of the Class VIII and vulnerable Class VII lands.
2. the protection afforded a water resource (Lake Henrietta) and its surrounding environs thus maintaining the present high water quality.

(b) Environmental Values -

1. Preservation of the intrinsic character of the area.
2. Improvement to the flora of the sub-alpine zone as a result of no grazing.
3. Preservation of a wildlife habitat.

(c) Farming Value -

The benefit that this plan will have to the property as a whole.

1. The benefit that the fencing can have on the management of the property.
2. The opportunity to expand production from what will be an improved base.
3. The initial inputs will ultimately mean that the returns from the property will accrue more promptly than would otherwise have been the case.

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Benefits of the Plan

	<u>1984/85</u>	<u>85/86</u>	<u>86/87</u>	<u>87/88</u>	<u>88/89</u>	<u>89/90</u>	<u>90/91</u>	<u>91/92</u>	<u>92/93</u>	<u>93/94</u>
Stock Increases	7574	17137	34369	43937	52453	52453	52453	51453	52453	52453
Increased Stock Performance	1728	3456	5184	6912	8640	10368	10368	10368	10368	10368
Labour Savings	-	-	-	200	250	250	250	250	250	250
<b>TOTAL BENEFITS</b>	<b>9302</b>	<b>20593</b>	<b>39553</b>	<b>50949</b>	<b>61243</b>	<b>63071</b>	<b>63071</b>	<b>63071</b>	<b>63071</b>	<b>63071</b>

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RYTON STATION

LISTING OF FULL INPUT FLOWS

FLOW

1	98000. 137260.	110390. 137260.	136990. 137260.	136990. 137260.	137140. 137260.	137260.	137260.
2	0. 15990.	0. 15990.	3900. 15990.	6930. 15990.	9960. 15990.	12990.	14490.
3	412150. 0.	303412. 0.	142280. 0.	44680. 0.	36530. 0.	14000.	4000.

NET CASH FLOW ANALYSIS

YEAR	NET FLOW	CUMULATIVE NET FLOW	DISCOUNTED FLOW AT -		
			5.00%	10.00%	15.00%
0	-314150.	-314150.	-314150.	-314150.	-314150.
1	-193022.	-507172.	-497981.	-489625.	-481995.
2	-9190.	-516362.	-505316.	-497220.	-488944.
3	85380.	-430982.	-432562.	-433072.	-432805.
4	90650.	-340332.	-357964.	-371157.	-380976.
5	110270.	-230062.	-271584.	-302688.	-326152.
6	118770.	-111292.	-182956.	-235646.	-274805.
7	121270.	9978.	-96772.	-173415.	-229215.
8	121270.	131248.	-14691.	-116842.	-189572.
9	121270.	252518.	63480.	-65411.	-155099.
10	121270.	373788.	137930.	-18656.	-125123.
11	121270.	495058.	1626916.	448392.	74718.

\*\*\*\*\* NOTE THAT THE DISCOUNTED AMOUNTS ARE CUMULATIVE AND THE FINAL AMOUNT IS CAPITALISED

PRESENT VALUES AT INTEREST RATES -	5.00%	10.00%	15.00%
PRESENT VALUE OF FLOW			
1	2817034.	1445665.	989251.
2	277348.	121737.	72009.
3	912770.	875036.	842524.
PRESENT VALUE OF... BENEFITS	2817034.	1445665.	989251.
ASSOCIATED COST	277348.	121737.	72009.
CAPITAL COST	912770.	875036.	842524.
TOTAL COST	1190118.	996773.	914534.
BENEFITS NET OF ASSOCIATED COST	2539686.	1323928.	917242.
BENEFITS NET OF TOTAL COST	1626916.	448892.	74718.
BENEFIT COST RATIO AT INTEREST RATES	2.37	1.45	1.08
INTERNAL RATE OF RETURN	16.7459		

RYTON STATION  
LISTING OF FUTURE FLOWS

FLOW							
1	9302. 63071.	20593. 63071.	39553. 63071.	50949. 63071.	61343. 63071.	63071.	63071.
2	0. 33909.	0. 35052.	5037. 36080.	9218. 36080.	14179. 36080.	28129.	32039.
3	183159. 0.	135425. 0.	122761. 0.	69005. 0.	63748. 0.	9090.	0.

NET CASH FLOW ANALYSIS

YEAR	NET FLOW	CUMULATIVE NET FLOW	DISCOUNTED FLOW AT -		
			5.00%	10.00%	15.00%
0	-173857.	-173857.			
1	-114832.	-288689.	-173857.	-173857.	-173857.
2	-88245.	-376934.	-283221.	-278250.	-273711.
3	-27274.	-404208.	-363262.	-351179.	-340437.
4	-16584.	-420792.	-386822.	-371671.	-359370.
5	25852.	-394940.	-400466.	-382998.	-367852.
6	31032.	-363908.	-380210.	-366946.	-354999.
7	29162.	-334746.	-357053.	-349429.	-341583.
8	28019.	-306727.	-336328.	-334464.	-330520.
9	26991.	-279736.	-317364.	-321393.	-321460.
10	26991.	-252745.	-299965.	-309947.	-313788.
11	26991.	-225754.	-283395. 48008.	-299540. -195478.	-307116. -262638.

\*\*\*\*\* NOTE THAT THE DISCOUNTED AMOUNTS ARE CUMULATIVE AND THE FINAL AMOUNT IS CAPITALISED

PRESENT VALUES AT INTEREST RATES -	5.00%	10.00%	15.00%
PRESENT VALUE OF FLOW			
1			
2	1197043.	571672.	366097.
3	605375.	258392.	148650.
	542660.	508757.	480084.
PRESENT VALUE OF...BENEFITS	1197043.	571672.	366097.
ASSOCIATED COST	606375.	258392.	148650.
CAPITAL COST	542660.	508757.	480084.
TOTAL COST	1149035.	767150.	628734.
BENEFITS NET OF ASSOCIATED COST	590668.	313279.	217447.
BENEFITS NET OF TOTAL COST	48008.	-195478.	-262638.
BENEFIT COST RATIO AT INTEREST RATES	1.04	0.75	0.58
INTERNAL RATE OF RETURN	5.5211		

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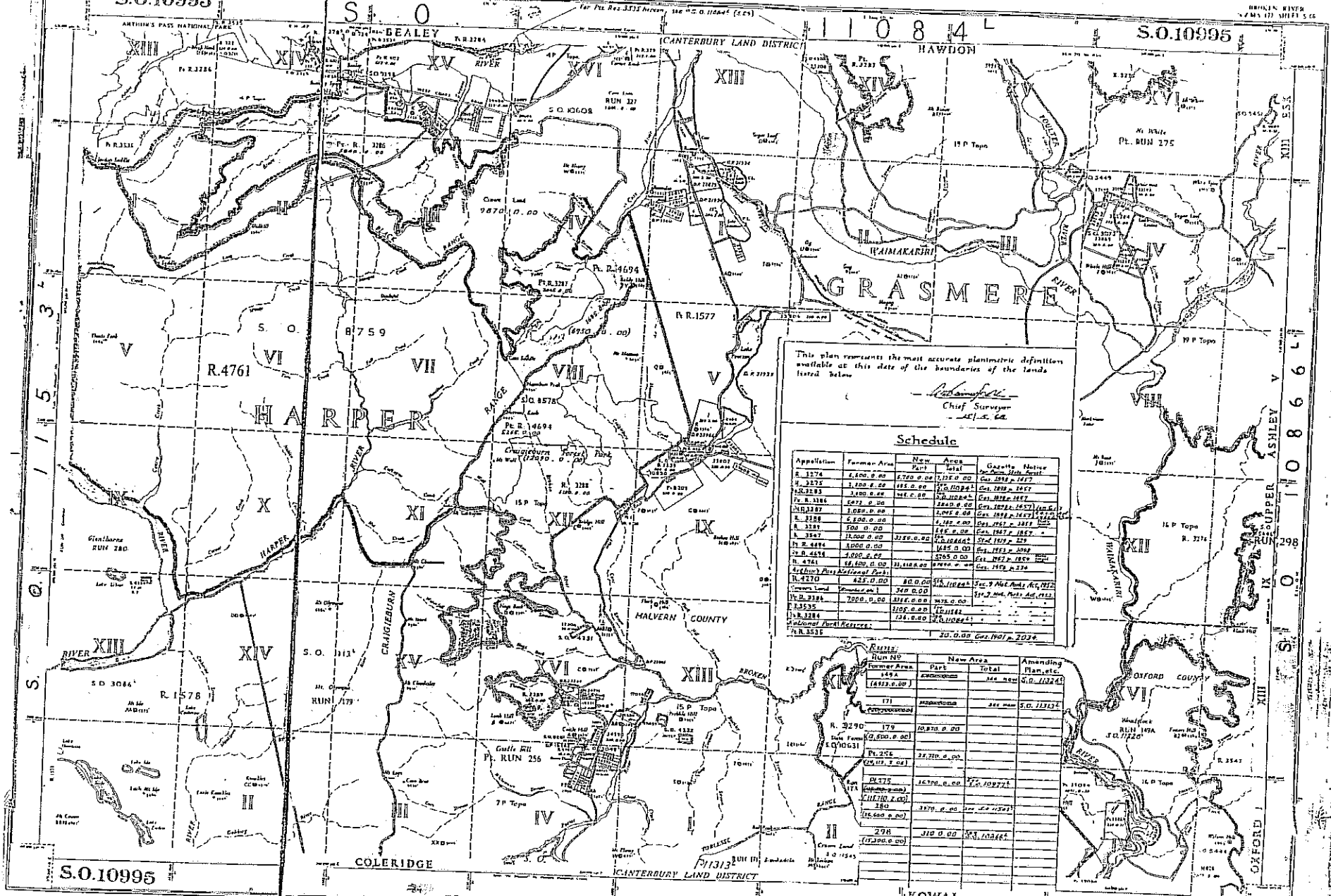
DESCRIPTION OF WORK  
 LEGEND  
 [Illegible text describing map symbols and scales]

*[Handwritten signature]*  
 REGIONAL ENGINEER  
 REGIONAL BOARD  
*[Handwritten initials]*

### NORTH CANTERBURY CATCHMENT BOARD AND REGIONAL WATER BOARD

NAME OF PROPERTY    RYTON STATION  
 OWNER                RYTON STATION LTD c/o RT ENGINEERS & MECHANICALS  
 ADDRESS              HAKARA GORGE

Scale 1:50,000	AREA 2,500 ha
Map No. SWCP 703250	



This plan represents the most accurate planimetric definitions available at this date of the boundaries of the lands listed below.

*Colquhoun*  
 Chief Surveyor  
 N.Z.S. 62

**Schedule**

Appellation	Former Area	New Area		Gazette Notice
		Part	Total	
R. 1274	4,400 a. 0. 0.	1,700 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3275	1,700 a. 0. 0.	165 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3283	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3284	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3285	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3286	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3287	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3288	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3289	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 3290	1,000 a. 0. 0.	441 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4270	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4271	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4272	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4273	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4274	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4275	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4276	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4277	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4278	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4279	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4280	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4281	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4282	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4283	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4284	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4285	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4286	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4287	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4288	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4289	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4290	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4291	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4292	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4293	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4294	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4295	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4296	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4297	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4298	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4299	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677
R. 4300	425 a. 0. 0.	80 a. 0. 0.	1,150 a. 0. 0.	Gas. 1962 p. 1677

Run No.	Former Area	New Area	Amending Man, etc.
145A	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
171	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
179	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
205	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
217S	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
280	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995
298	1,150 a. 0. 0.	1,150 a. 0. 0.	S.O. 10995

NZ 1415 177

**SHEET**

Scale: 60 chains to an inch (approx)

Scale: 1:63360 (1 inch to 1 mile)

Note: All runs are subject to Sec. 58 of the Land Act 1948 along rivers and creeks over 1/2 mile.

Scale: 60 chains to an inch (approx)

Scale: 1:63360 (1 inch to 1 mile)

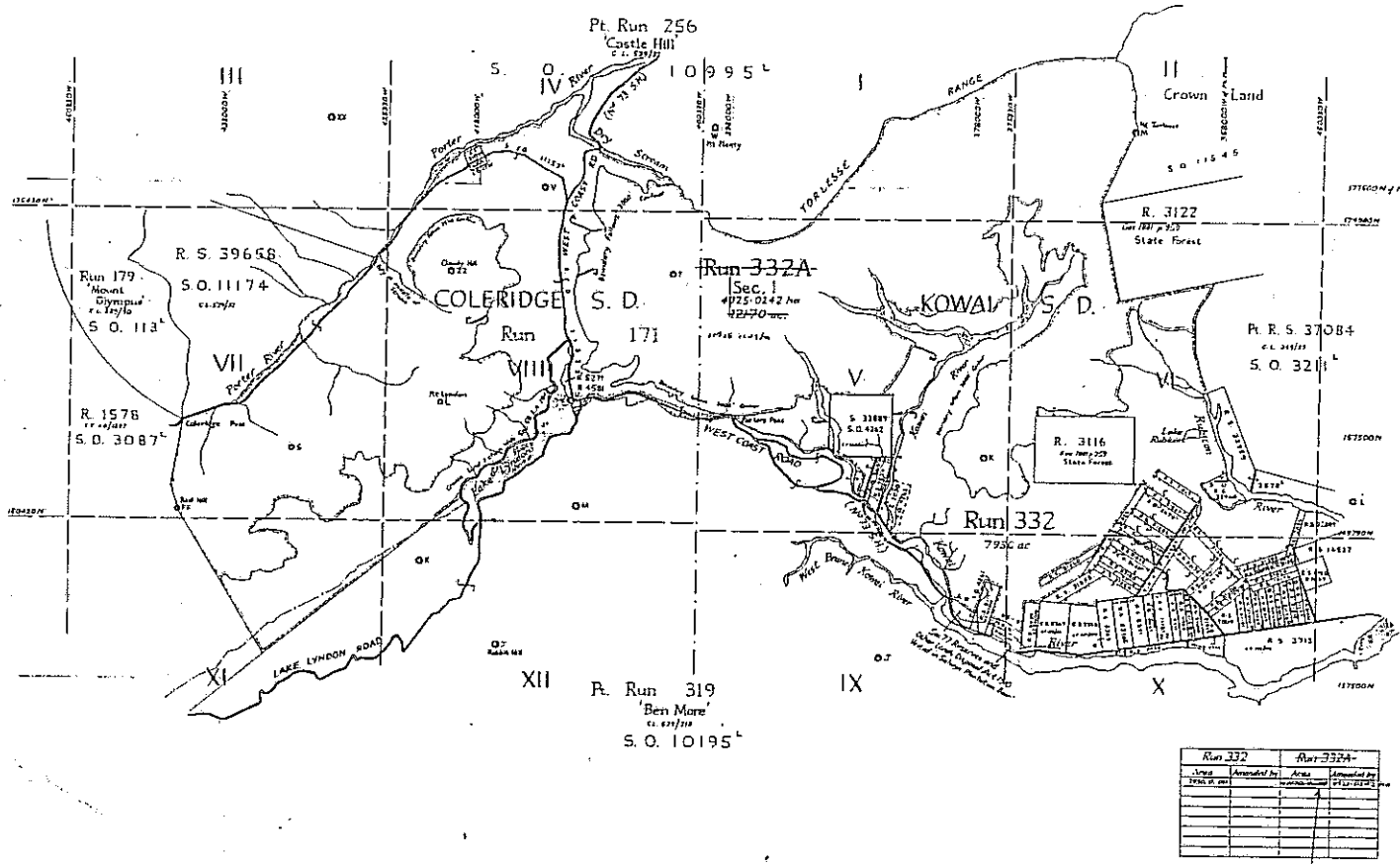
Note: All runs are subject to Sec. 58 of the Land Act 1948 along rivers and creeks over 1/2 mile.

Scale: 60 chains to an inch (approx)

Scale: 1:63360 (1 inch to 1 mile)

Note: All runs are subject to Sec. 58 of the Land Act 1948 along rivers and creeks over 1/2 mile.

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Sec. 1 added  
 A. Maudslayi  
 Chief Surveyor

Plan of  
 Run 332 'Brooksdale' and Run 332A  
 formerly Run 171 and Reserves 2030 and 2743  
 Canterbury Land District Malvern County  
 Scale 40 chains to an inch  
 September 1969

Compiled from approved surveys and photogrammetric plot S 74.

Ready shown coloured Bluel Stone  
 are legal roads.  
 All runs subject to Sec 24 of the Land Act 1955  
 along rivers and streams from 100 ft. and above.

Received ASB... 10-1-61  
 File... 1A-314  
 Instructions...  
 Reference Plans...  
 Examined by...  
 Approved from...  
 Plan is valid for approval

S.O. 11313

Total Area 20100 acs.  
 Approved  
 Chief Surveyor 1/10/69  
 11313

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