Farm Environmental Management Plan: Rostriever Station

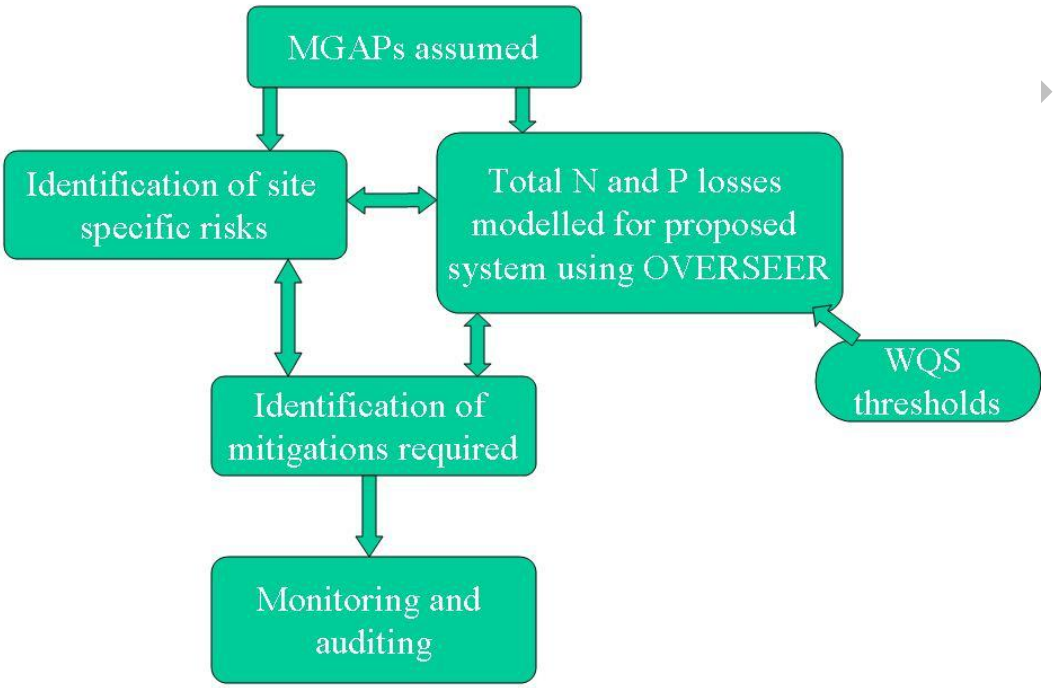
1. Introduction

The Water Quality Study ('WQS') funded by Mackenzie Water Research Limited ('MWRL'), found that the additional irrigation proposed in the catchment could take place without significant adverse effects on the environment providing that nutrient reduction occurred on the farms.

The process that was advocated for ensuring this on-farm nutrient reduction was through Farm Environmental Management Planing. A clear process for building a Farm Environmental Management Plan (FEMP) was laid out in the Water Quality Study and has been followed here. An overview schematic of the process of building a FEMP is shown in Figure 1.

The responsibility of the implementation, monitoring and auditing of the plan lies with the **farmer**.

Figure 1: Overview schematic of the process to build a Farm Environmental Management Plan



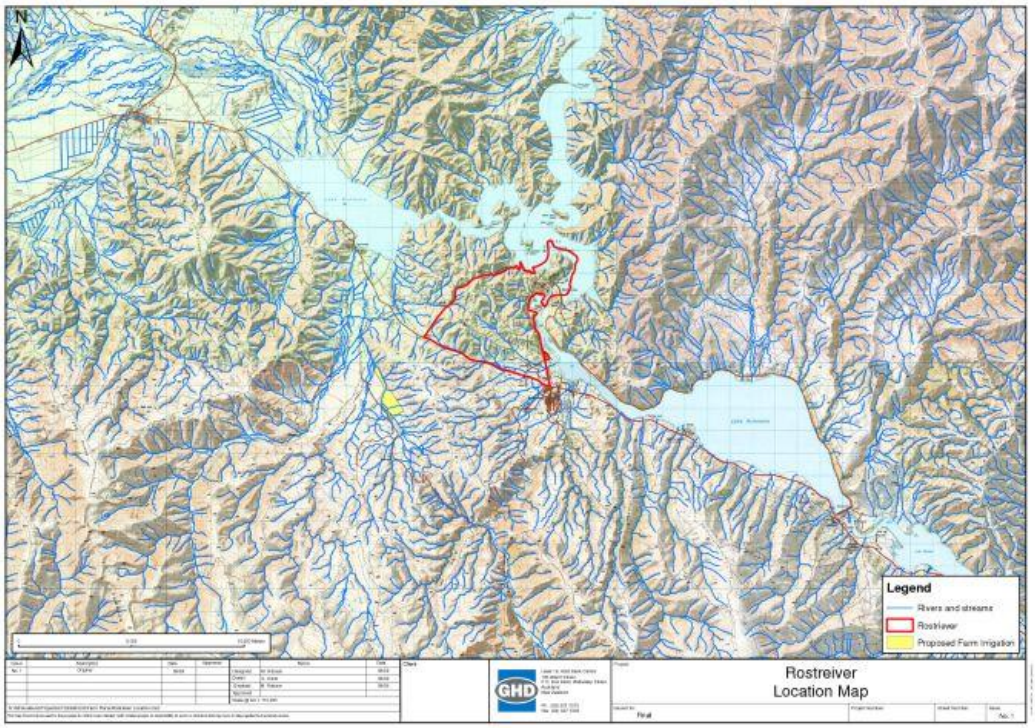
MGAP – Mandatory good agricultural practices

2. Farm Description

2.1 General farm description

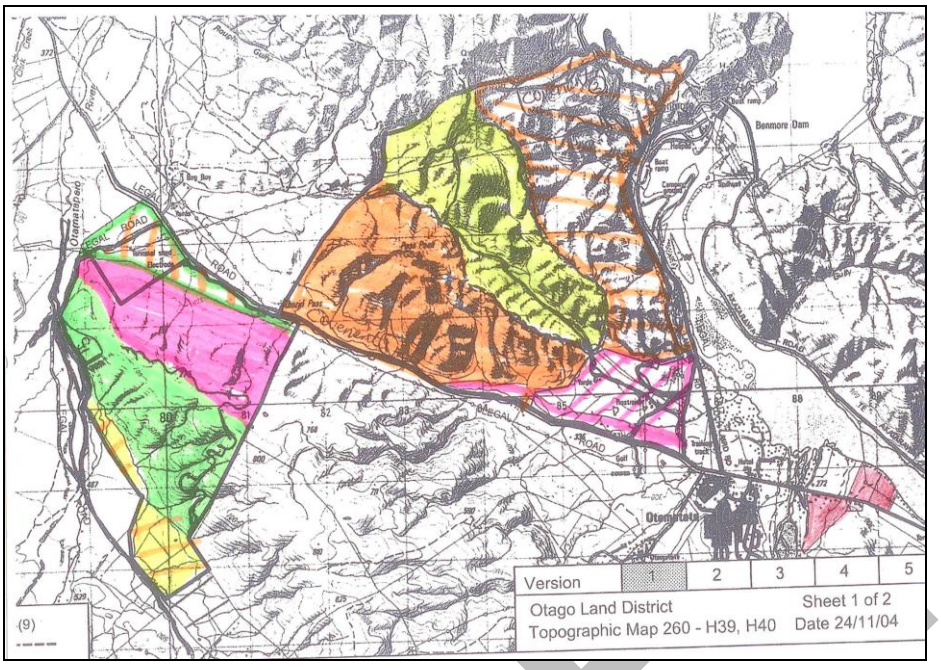
Rostriever consists of majority (90%) rolling to semi steep hills with an annual rainfall of 350mm per annum. Rostriever consists of 5 Hill blocks – 3 separate flat areas and 1 small freehold block which has a K-Line irrigated area of 28 hectares. There are three hill blocks of which one is oversown and the other 2 are natural native grasses. Winter supplement feed consists of Lucerne & Oat bailage from 18 hectares irrigated and 40 hectares un-irrigated. The rest of the flat land is cultivated and oversown.

2.2 Location - Otematata North Otago



Location Plan

2.3 Proposed farming system



Index of Blocks:

Block 1 Road face oversown (orange solid)

Block 2 Middle Block oversown (yellow solid)

Block 3 River or Lake Face Native (orange hatched)

Block 4 Back Hogget Block Oversown (green solid)

Block 5 Front Hogget Block Native (pink solid)

Block 6 Electrode Block Oversown & cultivated (green outline, orange hatched)

Block 7 Home Flat oversown (pink hatched)

Block 8 Freehold 2 Lucerne & 1 clover paddock (crimson pink solid)

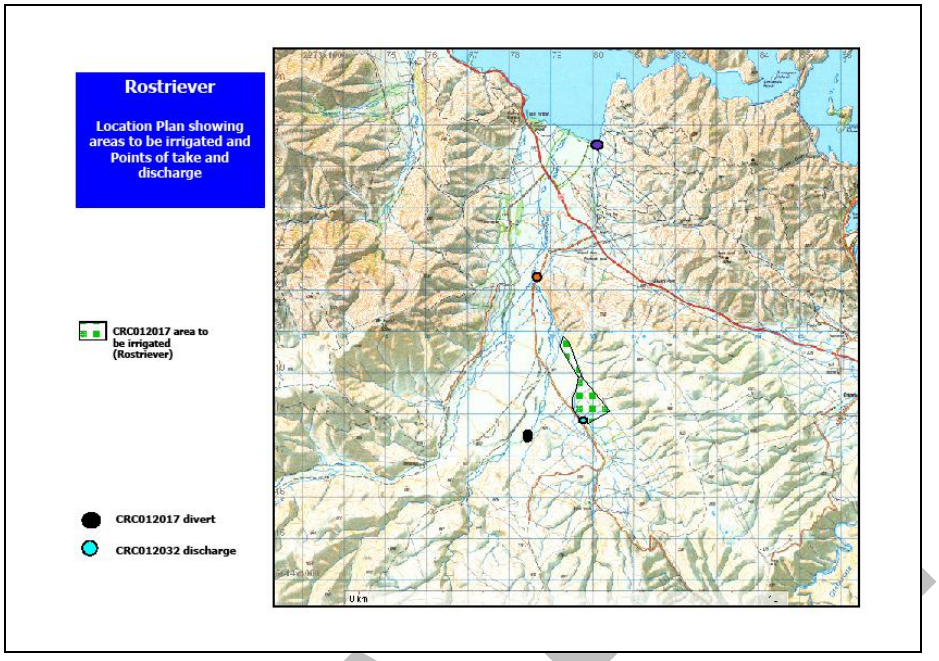
Block 9 Backyard paddocks – flat lucerne and grass – proposed irrigation (yellow solid with orange hatched)

Table 1: Cover Utilisation by season and stock class for current and proposed system

Class of stock	Spring	Summer	Autumn	Winter
Ewes – Hill	Block 1,2,3	Block 1,2,3	Nil	Block 1,2,3
2 T Ewes	Block 4	Block 5	Nil	Block 6
Ann Draft Ewes	Block 7 & 8	Block 7	Nil	Block 7 & 8
Hoggets	Block 5	Nil	Nil	Block 7
Cattle	Block 4	Block 4	Block 4	Block 4
Fat Lambs			Block 9	

2.4 Proposed farming system

Stocking rates will not change. Further irrigation will enable more winter feed to be grown, which would otherwise be purchased on the open market,



2.5 Soils

<u>Soil Types</u>

Eweburn 45mm

Grampians 90mm

Streamlands 90mm and 100mm

2.6 Topography

Index of Blocks:

Block 1 Road face oversown – rolling hill country mostly dark faces

Block 2 Middle Block oversown - rolling hill country 70% dark 30% sunny

Block 3 River or Lake Face Native- rolling country some dark mostly shale sunny faces

Block 4 Back Hogget Block Oversown- dark face med to steep with briar

Block 5 Front Hogget Block Native- sunny facing medium grade steepness

Block 6 Electrode Block Oversown & cultivated- flat, sunny some briar

Block 7 Home Flat oversown- poor solid type due to stripping for construction Benmore Dam

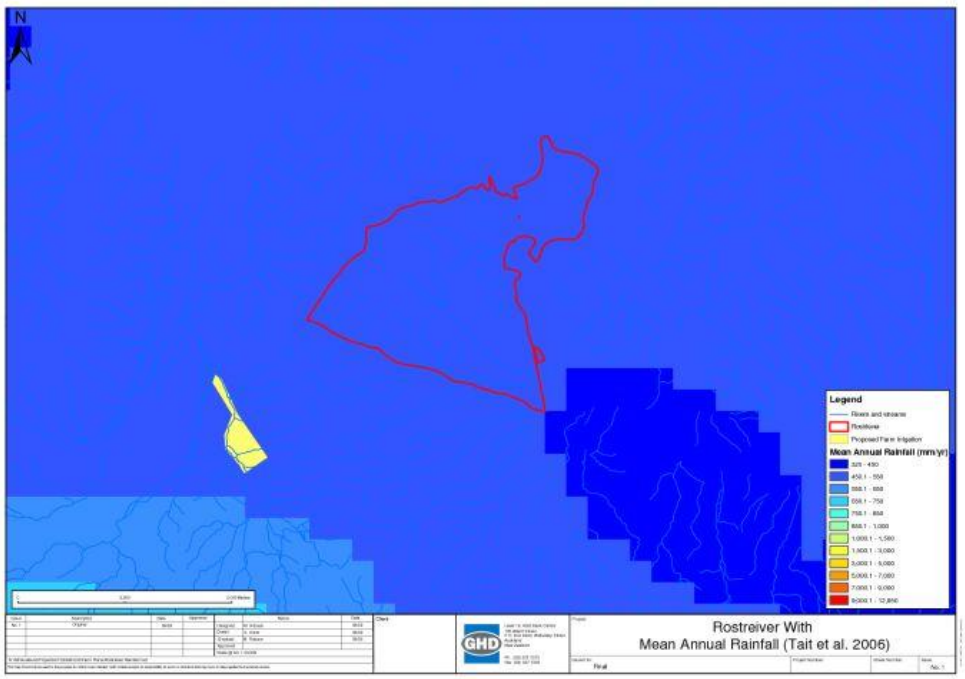
Block 8 Freehold 2 Lucerne & 1 clover paddock – flat K Line irrigation 2xlucerne and 1 grassy paddocks

2.7 Climate

Annual temperatures range from midsummer early 30 degrees to - 7 degrees mid winter.

Rainfall 350 to 400 mm per annum.

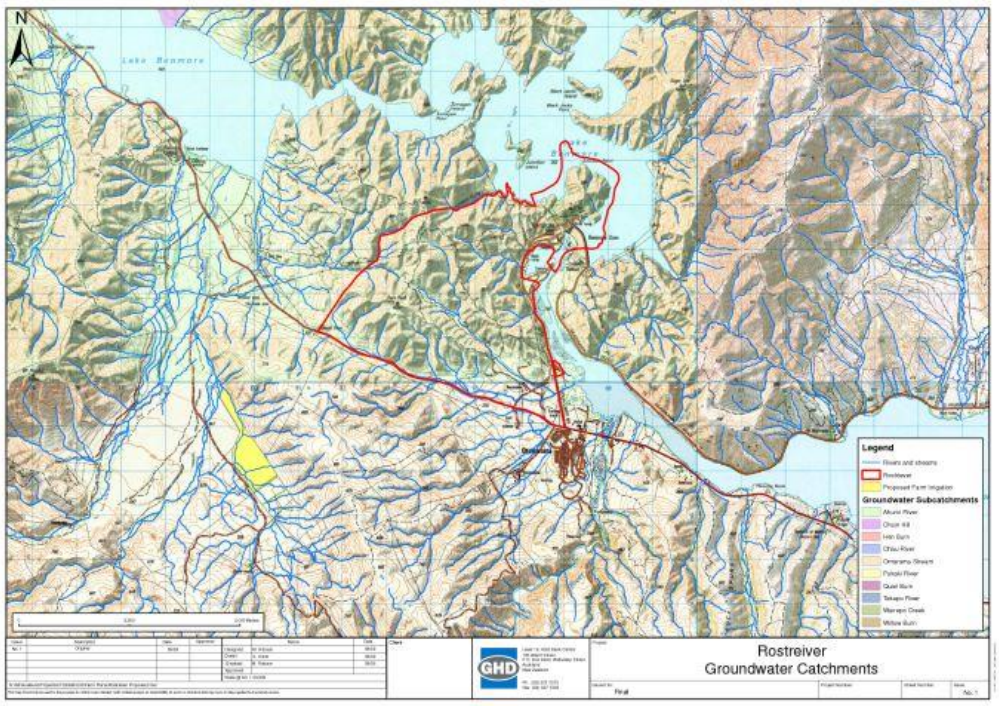
Snow – short duration (2-3 days) on the hills.



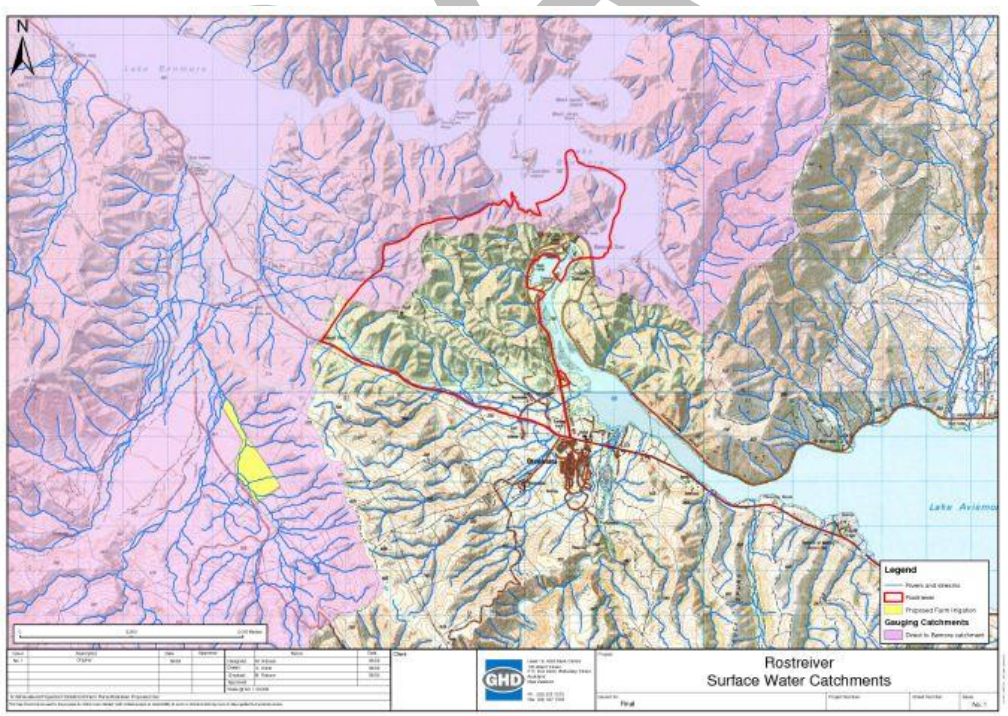
Rainfall Map

3. Environmental Context

The environmental context of the farm is a reference both to local and wider receiving environments.



Groundwater Catchment



Surface Water Catchment

3.1 Water Quality Study receiving environments and mitigation requirements

Rostriever Station, according to the WQS, has no groundwater catchment, but lies in the “Ahuriri Arm” surface water catchment.

The following table shows the calculated nutrient mitigation requirement of the receiving environments determined in the WQS and the resulting thresholds for N and P for Rostriever Station.

Ahuriri Arm Mitigation required kg/ha irrigated land
N -10.70
P -1.10

For this farm, the Ahuriri Arm mitigation requirements are the most stringent. These mitigation requirements cap Rostriever Station’s nutrient discharges at 5,286 kg N per annum and 169 kg P per annum. Upon further investigation it has been noticed within the WQS that the thresholds for Rostriever have been based on whole farm discharging into Lake Benmore which is not the case. Approximately 1/3 of the farm discharges into Lake Benmore with the remaining into Lake Aviemore. This can be plainly seen in the surface water catchment map above (Page 7)

3.2 Local receiving environments

The Otamatapaio River Catchment, Lake Aviemore and Lake Benmore are the local receiving environments.

The Otamatapaio River drains the Hawkdun and St Cutherbert Range, directly into the southern side of the Ahuriri Arm of Lake Benmore at Sailors Cutting. The Otamatapaio River has a catchment area above SH83 of 185km^2. Corbies Creek also contributes to the Otamatapaio catchment.

The catchment altitude ranges from 360m up to 1850m, and the upper catchment has snow on the shady faces for much of the winter months and therefore low flows in the catchment are usually experienced in winter.

There are significant flow losses down the system below the Foot Bridge; however the losses are the greatest approximately 200 metres downstream of the Corbies Creek confluence where often in the summer months the river bed is completely dry.

The Otamatapaio supports fisheries common to high country rivers. These include common and upland bullies, common river galaxies, rainbow and more predominantly brown trout.

Lakes Aviemore and Benmore is a hydro lake, and part of Rostriever Station was inundated with the creation of the lakes in the 1950’s. Therefore, part of the station now borders the lakes.

4. Farm Environmental Management Plan development

4.1 Stage 1 – Mandatory good agricultural practices

The table below shows the mandatory good agricultural practices that will be adopted. These include the base assumptions of OVERSEER and therefore help validate the use of the model on the farm.

Table 2. Mandatory good agricultural practices

Mandatory good agricultural practices	What these practices mean on farm
Fertilisers applied according to code of practice for fertiliser use	The fertiliser users' code of practice aims to ensure that where fertilisers are used that they are used safely, responsibly and effectively and in a way that avoids, remedies or mitigates any adverse environmental effects. The code of practice includes guidance on fertiliser use, application, storage, transport, handling and disposal.
Use a fertiliser recommendation system (nutrient budget) and account for all sources of nutrients including applied effluents and soil reservoirs accounted for	Planning fertiliser applications to all crops, determining crop requirement and accounting for soil nutrients and organic nutrient supplies, all reduce the risks of applying excessive fertiliser above the crop requirement. This maximises the economic return from the use of fertilisers and reduces the risk of causing nutrient pollution of the environment Accounting for all sources of nutrients including imported sources and soil reservoirs is an important management measure in all farming systems and become especially important on farms where manure is produced and applied to the land. The re-application of organic manures to land is often thought of as a disposal of a waste product, and the available nutrients within the organic manures are not accounted for. The use of an integrated nutrient budgeting tool such as OVERSEER automatically accounts for nutrients supplied in organic manures.
Fertiliser application applied evenly	The even application of fertiliser is an assumption of the OVERSEER model as included in the fertiliser code of practice. Fertiliser spreaders should be tested and calibrated in-house at least annually and every 5 years by an independent auditor.
Irrigation and effluent applied evenly	The even application of water and or effluent is an assumption of the OVERSEER model. Irrigators should be tested and calibrated in-house at least annually and then every 5 years in accordance with the code of practice for irrigation evaluation by a qualified irrigation auditor.
Crop, cultivation, nutrient inputs and yield records kept per farm management unit	Maintaining good crop input records is important for: • The calculation of cumulative annual organic fertiliser applications and also their contribution to long term nutrient supply; • The prediction of realistic crop yields that are used to determine crop requirements; • Providing accurate inputs to the OVERSEER nutrient budgeting model that is being used here as a proxy for measuring diffuse nutrient losses.

Good design of irrigation systems	Design will match soil properties and low application amounts on shallower soil to prevent summer drainage.
Robust irrigation scheduling	Good irrigation scheduling to prevent summer drainage.
Supplement and feeding out management	To be addressed in the Farm Environmental Risk Assessment.
Winter grazing management	To be addressed in the Farm Environmental Risk Assessment.

4.2 Stage 2 – OVERSEER and meeting WQS mitigation requirements

The WQS thresholds set Rostriever Station, using the most stringent nutrient mitigation requirement, are 5,286 kg N/year and 169 kg P/year. Table 5 below shows the output from OVERSEER for the modelled proposed farming system at Rostriever Station. The results illustrate that the proposed farm system losses as modelled by OVERSEER are outside the initial thresholds set by the WQS.

Table 3: Total N and P losses modelled by OVERSEER for the proposed farming system on Rostriever Station and WQS thresholds

	Nitrogen Threshold (kg/farm)	Phosphorous Threshold (kg/farm)
MWRL Water Quality Study Property Thresholds	5,286	169
OVERSEER® outputs	5,384	47

4.3 Stage 3 – Identification and mitigation of site specific environmental risks

4.3 Farm Environmental Risk Assessment (FERA)

4.3.1 All the regularly used (once or twice a day) tracks on the property are culverted or bridged. There is no issue with any runoff from the tracks directly entering any watercourse as they are a long way from any. There is one stream flowing through the bottom of the proposed irrigation sight that is not bridged and in parts that it is crossed is not culverted **(see photos of this stream)**. This stream will usually be dry by late December. The other streams on the property are usually the same as above and dry up during December. The Otamatapaio River has usually got a bit of water in it over the summer, but it is not uncommon for this to dry up on occasion during the late summer.

4.3.2 No silage pits or buns seen, property makes all bailage and hay.

4.3.3 There are smaller streams running through some paddocks that are not fenced and are used for stock water. Stock are not often in these paddocks as this is where a large majority of the supplementary feed comes from.

4.3.4 Over the winter month's stock are not set on the lower paddocks that are being proposed for irrigation, but are instead set on the hill.

4.3.5 In the yards, (which the majority are located back from streams minus one, where the proposed k-line is going to be) water is not often used, and if it is it collects in the yards and is allowed to evaporate.

4.3.6 There are no real areas of interest on the property that I was made aware of. There was one species of fish (Galaxiids?) that was noted in a study that inhabited the swampy area at GPS position E2279732 N5618315. This location was taken on the boundary of this area.

4.3.7 At the above GPS position there is a small wet area/swamp found; this is fenced off into its own block, with stock not accessing it often, but during certain periods of the year stock have access to this area for stock water. The only stock that will have access to this are sheep (Approximately 500).

4.3.8 If any large areas are being sprayed out contractors are brought in.

4.3.9 No border dyke irrigation, with 18Ha of currently K-line irrigated land, there is no other land on the property that is irrigated, but the proposed area will be under k-line or guns.

4.3.10 The soils in the area are usually turned over or maxi tilled to help get rid of the weed in the paddock. If the weed is under control then the paddock would be direct drilled. The lucerne is direct drilled.

4.3.11 During the winter months there may be stock on the low paddocks for one or two weeks depending on the weather, this may only be 500 ewes, which then go up the hill.

4.3.12 No compacted or consolidated soils on the property.

4.3.13 Pest control measures in place are; shooters, or pindone (rarely), 1080 may be used if they get bad, but hasn't been used for around fifteen years. Not a lot of broom or gorse but in areas where there are patches it will be spot sprayed.

4.3.14 Fertilisers used on the property this year and in the past are; Lime at 1 tonne per hectare, this is applied most years, 200kg per hectare of Lucerne mix (in the Lucerne), 100kg of Super Phosphate over the rest of the developed land and oats, the hill country doesn't often get fertiliser, but if it does it would be 100kg of Super Phosphate per hectare.

4.4 General issues on extensive high country farming systems

In extensive high country farming systems there are a number of issues that on more intensive farming systems would be assessed as being a risk to water quality but on extensive high country farming systems they have not been defined as a risk due to the extensive nature of the farming systems and the lower stocking rate per hectare. Some of these general issues have been identified below:

1. There will be areas within the farming system where tracks will cross waterways; these are tracks that are used irregularly, in extensive areas of the farm.

2. There are also areas within a high country farming system where stock will have unrestricted access to streams for crossings and stock water. This is an essential access for stock movement and stock water. On most farms there are a number of small creeks/streams that flow within the hill country and it would be logistically impossible to place stock crossings on all of these. There is also the need for stock to move across streams/creeks within a block (paddock) for grazing access. A reticulated water system would be unsustainable in the hill country as troughs would freeze solid in the winter months, preventing access to fresh drinking water.

3. Swamps/heavy grounds are an integral area in a high country farming system; they provide a water source and good grazing for stock in dry years. In undertaking the FERA it has been identified that all swamps/heavy ground need to be monitored to ensure that bank erosion, compaction and pugging does not occur.

4. Wind erosion is a significant issue in the upper Waitaki Catchment. The sparse vegetation on large areas of land in the Mackenzie Basin gives little protection to the shallow, friable soils which continue to be eroded by frost heave and westerly winds. A mean soil loss of 0.22 mm/year or 2.2 tonnes of soil lost per across a number of sites within the Mackenzie Basin has been reported. While it cannot be assumed from this information that erosion rates will continued at this level in the future, the results do confirm a strong relationship between the percentage of vegetation cover and erosion risk. The problem of bare ground and exposure to wind erosion has been compounded since the early 1990s by the rapid spread of hieracium particularly on the poorest soils. One of the most significant impacts of further irrigation in this area would be a reduction in the amount of bare ground and corresponding reduction in wind erosion risk. (*Environmental, Economic and social impacts of irrigation in the Mackenzie Basin.Ministry for the Environment, February 2005.)*

5. Monitoring and identification of any problems arising for the above three issues has been included in Table 8.

5. Farm Environmental Management Plan for Rostriever Station

5.1 Mitigation measures and management options adopted on Rostriever Station

The table below shows the all the mitigation and management tools that are proposed to be undertaken on Rostriever Station. Measures indicated as **FEMP stage 1 are those identified as Mandatory Good Agricultural Practice**, **measures identified as FEMP stage 2 are those changes that have been modelled in OVERSEER to meet the WQS mitigation requirement (if required)**, and those indicated as **FEMP stage 3 are mitigation measures chosen to ameliorate site specific environmental risks on the farm.**

Table 4 indicates in brief how the measures are to be monitored and audited.

Table 4. Table of mitigation options, monitoring and auditing for Rostriever

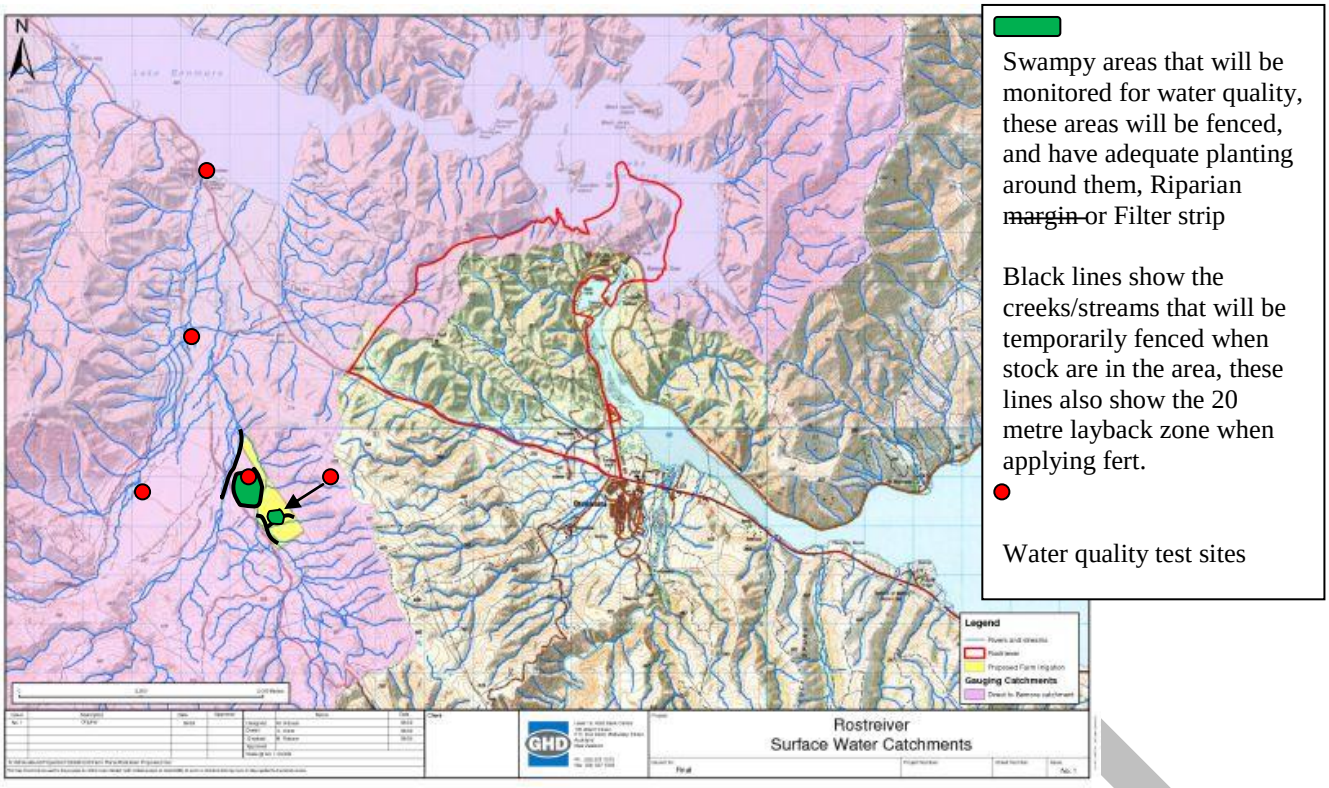
FEMP stage	Measure	Monitoring	Auditing
1	Fertilisers applied according to code of practice for fertiliser use		Self certification
1	Accounting for all sources of nutrients including applied effluents and soil reservoirs	Soil and effluent testing and cumulative effluent inputs per management unit	Reconciliation of fertiliser, effluent and soil records with nutrient budget for example blocks. Submission of examples soil and effluent tests
1	Even fertiliser application	Calibrate and optimise fertiliser spreaders annually and every 5 years by an external auditor	Submission of testing and calibration
1	Even irrigation and effluent application	Calibrate and optimise irrigators annually in house and every 5 years by an external auditor	Submission of testing and calibration
1	Record crop, cultivation, nutrient inputs and yields per farm management unit	Upkeep of records	Submission of example block records
1	Good design of irrigation systems	Design of irrigation system by a certified professional	Irrigation system audited by a certified auditor every 5 years
1	Robust irrigation scheduling	Calculation of annual % effective water use	Submission of annual % effective water use
2	No winter application of fertiliser	Field records	Signed field records
2	N fertiliser applications split to under 50 kg N/application	Field records	Signed field records
2	No P fertiliser within three weeks of irrigation	Field records	Signed field records
2	Olsen P of below 30 maintained	Regular soil testing (every 3 years)	Submission of soil tests
3	Fence along the stream that flows at the base of the paddocks where the irrigation is proposed, allow for drinking bays for stock water	Photos	Annual auditing visit.
3	Temporarily fence off the small area of swamp in the middle of the paddock as seen in the photo	Photos, visits to test quality of the swamp	Annual auditing visit

FEMP stage	Measure	Monitoring	Auditing
3	Culvert the various tracks that cross through the stream at the base of the paddocks.	Photos	Annual auditing visit, and photos in the audit report once completed
3	20 metre layback from any water way when applying fertliser by land based application e.g. bulk spreader	Field records	Annual auditing visit and report
3	Maintain a 5-11m setback from irrigation to a permanently flowing waterway	Photos	Annual audit report and audit visits
3	Create an adequate track for moving of stock across this stream	Photos	Annual auditing visit

Photo showing the small swamp/heavy ground area located within the paddock. This area is approximately 50 metres by 50 metres

Swampy area that is fenced and will have stock access restricted during the winter

Swampy area located at point E2279732 N5618315



Swampy areas that will be monitored for water quality, these areas will be fenced, and have adequate planting around them, Riparian ~~margin~~ or Filter strip

Black lines show the creeks/streams that will be temporarily fenced when stock are in the area, these lines also show the 20 metre layback zone when applying fert.

Water quality test sites

5.2 Monitoring and Auditing

5.2.1 Baseline monitoring

Baseline monitoring is already underway on Rostriever Station.

Table 5. Baseline monitoring on Rostriever

		Location	Frequency	Measured parameters to include
Soil	Soil nutrient testing	All irrigation paddocks and intensive areas in rotation	1 in 3 years	Standard suite of soil nutrients
Pasture	Ground cover and species	All blocks		% Ground cover, species

5.2.2 On-going monitoring

On going monitoring and auditing of FEMP are as important as the plan itself.

Table 7 above shows the monitoring suggested for the mitigation and management options chosen for Rostriever Station and Table 9 below shows the frequency and parameters for the monitoring. The triggers and contingency plans will be finalised in consultation with farm consultants once the FERA has been completed and all the mitigation measures identified.

Table 6. Example monitoring plan for Rostriever Station showing location, frequency and parameters for monitoring

		Location	Frequency	Measured parameters to include	Triggers	Contingency plan if triggers are exceeded
Soil	To include: Soil nutrient testing	All irrigation paddocks and intensive areas in rotation	1 in 3 years for soil nutrient status	Standard suite of soil nutrients	Olsen P >30	Reduce or stop the application of P fertiliser to the area and monitor
Soil	Soil compaction testing	All irrigation blocks in rotation	Annually for soil compaction testing.	Soil compaction	Compaction, surface capping	Remove compaction with the appropriate tool
Runoff	Wet weather survey	All blocks	Annually	Runoff	Runoff occurring	Introduce runoff removal infrastructure where appropriate.
Water	Surface water quality	Corbies Creek and Bog Roy intake in conjunction with Bog Roy and Otematata.	Quarterly to be consistent with ECAN for the first 5 years and then reviewed	Total Nitrogen, nitrate, ammonia, total Kjeldahl nitrogen, total phosphorus, dissolved reactive phosphorus, suspended solids.	No significant decrease in water quality	If comparative surface water analysis indicates a decrease in surface water quality then the particular contaminant should be identified while a full root cause analysis is undertaken
Water	Surface water quality	Swamp located at GPS point E2279732 N5618315	Quarterly to be consistent with ECAN for the first 5 years and then reviewed	Total Nitrogen, nitrate, ammonia, total Kjeldahl nitrogen, total phosphorus, dissolved reactive phosphorus, suspended solids.	No significant decrease in water quality	If comparative surface water analysis indicates a decrease in surface water quality then the particular contaminant should be identified while a full root cause analysis is undertaken
Water	Irrigation application	Irrigation area	Annually in house and 1 in 5 years by an independent	Application uniformity	>80 %	Optimisation of the irrigator performance will be performed at the time of testing
Tracks that cross waterways	Visual assessment of bank/track erosion	All tracks that cross creek/stream within extensively farmed areas	Annually	Visual assessment of bank/stream erosion caused by vehicle crossing or stock	Any sign of extensive visual erosion	Restrict vehicle and stock access until an assessment of the damage and cause can be made
Fertiliser	Fertiliser application	All Farm	Annually in house and 1 in 5 years by an independent	Application uniformity	>80 %	Optimisation of the spreader performance will be performed at the time of testing
Weed and pest pressures	Weed and pest populations	Relevant blocks	Annually	% or magnitude of infestation	ECAN monitor and communicate if their triggers have been exceeded	Legislative compliance with notice of direction issued by ECAN

Where triggers are exceeded, the immediate contingency plans in Table 9 should be implemented while a 'root cause' analysis is carried out. Any further mitigation measures to be adopted as a result of monitoring should be added to Tables 7, 9 and 10.

1) Is the current mitigation option implemented correctly?

No – Implement and monitor

Yes – to 2)

2) Has anything changed in the farm system?

Yes – remodel and monitor

No – to 3)

3) Have there been abnormal conditions at the time of trigger breach?

Yes – continue monitoring to see if trigger breach continues

No – Seek advice if suitably qualified person to investigate root cause and suggest appropriate mitigation.

If emergency conditions occur that risk a pollution event, such as a catastrophic failure of the irrigation system that is resulting in overland flow to a watercourse, seek immediate guidance from you regional council:

Environment Canterbury 0800 76 55 88

5.2.3 Auditing

The auditing process allows both the farm operator to illustrate, and other interested parties to have confidence that the management practices and mitigations planned for the farm are being implemented. In addition, the audit shows that there is a mechanism for the adaptive management of the property should the chosen mitigation or management not perform to expectations.

An annual audit is proposed, and requires both external and in-house input. The annual audit should be completed and submitted to ECan by end of July each year.

Table 7 below shows an example of an annual audit report for Rostriever Station.

Table 7. Table showing proposed contents of an annual audit report for Rostriever Station

Mitigation Measure	Audit Measures	Action in case of non compliance
	Annual audit of OVERSEER nutrient budget and report based on previous 3 years. Submission of compliance with thresholds	Should the OVERSEER report show losses exceeding the threshold, further mitigations should be adopted to effect a reduction in nutrient loss to below thresholds.
	Submission and brief interpretation of water quality analysis	Where triggers have been exceeded, immediate contingency plans should have been carried out and a root cause analysis conducted. The results of which should be presented here.
	Submission and brief of annual wet weather survey	Any remedial actions proposed after the annual survey should be undertaken.
	Submission and brief of annual tracks that cross waterways survey	Any remedial actions proposed after the annual survey should be undertaken
	Submission and brief of annual compaction survey of the irrigation area	Any remedial actions proposed after the annual survey should be undertaken
	Annual pest and weed survey undertaken by Ecan should be submitted	Legislative compliance

Even irrigation application	Calibrate and optimise irrigators annually in house and every 5 years by an external auditor	Submission of testing and calibration
Record crop, cultivation, nutrient inputs and yields per farm management unit	Verification of records	If records have not been produced then this should be rectified for next audit
Good design of irrigation systems by a certified professional and audited every 5 years	Irrigation system audited by a certified auditor every 5 years and any changes recommended should be implemented	If changes recommended not implemented then this should be rectified by next audit
Robust irrigation scheduling	Verification of records	If records not received then this should be rectified by next audit
No June/July application of fertiliser on the irrigated area	Field records	If records not received this should be rectified for next audit.
N fertiliser applications split to under 50 kg N/application	Field records	If records not received this should be rectified for next audit
No P fertiliser within three weeks of irrigation	Field records	If records not received this should be rectified for next audit
Olsen P of below 30 maintained	Submission and brief interpretation of soil test results	Where triggers have been exceeded, immediate contingency plans should have been carried out and a root cause analysis conducted. The results of which should be presented here.
Fence along the stream that flows at the base of the paddocks where the irrigation is proposed, allow for drinking bays for stock water	Check fenced area is present. Photos	Areas of fencing damage should be repaired.
Temporarily fence off the small area of swamp in the middle of the paddock as seen in the photo	Check fenced area is present. Photos	Areas of fencing damage should be repaired.
Culvert the various tracks that cross through the stream at the base of the paddocks.	Photo once installed	Timeline for completion required, if not completed prior to indicated timeframe then should be rectified by next audit
20 metre layback from any water way when applying fertliser by land based application e.g. bulk spreader	Field records and maps	If maps not received with annual audit this should be rectified by the next audit.
Maintain a 5-11m setback from irrigation to a permanently flowing waterway	Check setback area is present. Photos	Areas of less than 15m setback should be extended to ensure the minimum is 5m.
Create an adequate track for moving of stock across this stream (see map)	Check track has been upgraded and is present. Photos before and after track upgrade	Areas of track damage should be repaired.

6. Summary

This FEMP has been written to serve two purposes; to ensure the existing farm system can meet the nutrient mitigation requirements set out by the MWRL Water Quality Study, and to set out the process for identification of farm specific environmental risks that arise from the inherent characteristics of the farm and from the existing farm system and its management.

The WQS thresholds and modelled outputs from OVERSEER detailed in Section 4.2 illustrate that this proposed system meets the WQS thresholds identified.

A full on-farm risk assessment was completed in December 2009 with a commitment to address the risks identified. Section 4.3 sets out the risks identified for this property and those issues common to all high country farming systems, along with existing mitigation measures.

The mitigation and management measures detailed in Table 4 set out the measures that have been adopted to mitigate and manage the risks that were identified in the risk assessment along with mandatory good agricultural practices and those measures that have been modelled in OVERSEER.

Baseline monitoring and any additional monitoring proposed for this property are identified and set out in Section 5.2, Tables 5 and 6 allows the performance of the measures chosen to be monitored and where they are performing sub-optimally, these can be addressed through the root cause analysis process.

The auditing of this plan, addressed in Section 5.2.3, Table 7 ensures that the relevant mitigation measures outlined in Table 4 are audited annually either internally or externally and communicated to ECAN by the end of July each year.