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PATTLE DELAMORE PARTNERS LTD

Annual Report for WIL Nutrient Discharge Consent: Year Ending 30 November 2021

Waimakariri Irrigation Limited

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Prepared for

Waimakariri Irrigation Limited

November 2021

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Quality Control Sheet

TITLE	Annual Report for WIL Nutrient Discharge Consent: Year Ending 30 November 2021
CLIENT	Waimakariri Irrigation Limited
VERSION	Final
ISSUE DATE	30 November 2021
JOB REFERENCE	CJ49511
SOURCE FILE(S)	CJ49511_Annual_Report_Nutrient_2021.docx

DOCUMENT CONTRIBUTORS

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Limitations:

This report has been prepared on the basis of information provided by Waimakariri Irrigation Limited and others (not directly contracted by PDP for the work), including Water Strategies Ltd and Terra Centric Land & Environment. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Waimakariri Irrigation Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

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Appendices

1.0 Introduction

Waimakariri Irrigation Ltd (WIL) operates an irrigation scheme between the Waimakariri and Ashley Rivers, as shown in Figure A1 (Appendix A). WIL were granted consent CRC184861 on 4 September 2018 to discharge nutrients from farming activities occurring within the WIL scheme.

Conditions 10 and 11 of CRC184861 requires an annual report to be prepared by 30 November each year. This report has been prepared by Pattle Delamore Partners (PDP) Water Strategies Ltd on behalf of WIL to fulfil the reporting requirements of consent CRC184861.

2.0 Consent Requirements

The reporting requirements for consent CRC184861 are outlined below.

Condition 10

e. *The consent holder shall prepare an annual report describing the results of the ASM programme and the audits that have been conducted each year. The report shall include:*

   i. *The name of the FEP auditor(s);*

   ii. *A summary of the audit performance grading;*

   iii. *A summary of the reasons for any farm receiving a C or D grade;*

   iv. *A summary of the actions taken to address C or D grades;*

   v. *A summary of farms that repeatedly received a C or D grade;*

   vi. *The progress achieved for previously identified issues, if applicable;*

   vii. *The total annual loss of nitrogen from all properties within the Irrigation Scheme or Principal Water Supplier over the reported year;*

   viii. *The annual average nitrogen loss to water for each property listed in Schedule CRC184861A and Schedule CRC184861B, as calculated in accordance with Appendix CRC184861;*

f. *A copy of the annual report shall be provided to the Canterbury Regional Council, by 30 November each year.*

Condition 11

The consent holder shall:

a. *Prepare an annual report which describes:*

   i. *The number of properties and the total area of irrigated land and unirrigated land of those properties listed in the Schedules;*

   ii. *The results of the ASM, which includes the audits that have been undertaken each year in accordance with Condition 10;*

   iii. *A record of the annual loss of nitrogen for the preceding 12-month period (being from the 01 August until the following 31 July) for all properties listed in the Schedules;*

   iv. *Any incidence of non-compliance with the requirements set out within the individual Farm Environment Plans;*

   v. *The actions taken by both the consent holder and (as necessary) the landowner(s) in the Schedule to remedy or mitigate non-compliance identified in accordance with Condition 10.*

b. *Provide a copy of the report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager by the 30 November every year.*

3.0 Irrigated Land

Table 1 below shows the irrigated and unirrigated land within the WIL scheme. The irrigated and total farm areas were obtained from the individual farm environment plans (FEPs). Schedule A properties are those that utilise the WIL nutrient discharge consent to authorise the nitrogen losses from their farming activity. Table 1 shows that the properties within Schedule CRC184861A (Schedule A) had a combined irrigated area of 23,243 ha and a combined total farm area of 31,306 ha.

Properties listed in Schedule CRC184861B (Schedule B) hold their own consents that specify the nitrogen discharge allowance for their farm. Five properties are currently listed in Schedule B (see section 6.2 of this report).

Table 1: Irrigated area within WIL scheme as at November 2021

Area	Irrigation area (ha)	Dryland area (ha)	Non-productive area (ha)	Total area (ha)
Schedule A - FEP	22,815	6,507	1,283	30,605
Schedule A - Lifestyle blocks	428	273		701

Table 1: Irrigated area within WIL scheme as at November 2021				
Area	**Irrigation area (ha)**	**Dryland area (ha)**	**Non-productive area (ha)**	**Total area (ha)**
Schedule A Total	*23,243*	*6,780*	*1,283*	*31,306*
Schedule B	856	206	77	1,139
Total	**24,099**	**6,986**	**1,360**	**32,445**

4.0 Results from Audited Self-Management Programme

Condition 10 of CRC184861 requires WIL to implement and adhere to an audited self-management (ASM) programme. The ASM document was developed by PDP and WIL and was submitted to ECan on 1 July 2016. A copy of the ASM document is included in Appendix B.

4.1 ASM Reporting Requirements

The ASM reporting requirements are outlined in Condition 10e of CRC184861, as outlined in section 2.0 of this report.

4.2 FEP Auditors

All FEP Auditors have completed the Advance Sustainable Nutrient Management Course from Massey University and had been registered as accredited FEP Auditors by Environment Canterbury (ECan). Shareholders who have achieved Synlait's *Lead with Pride* accreditation were not audited through the WIL FEP audit programme, but their equivalent grades are reported here.

In the 2020-21 season, the WIL farm environment plans (FEPs) were audited by three auditors, as listed in Table 2.

Table 2: FEP Auditors		
Name	**Organisation**	**Certification**
Leah Gorman	EnviroPlan Limited	Certified FEP Auditor
Amelia Wood	The Agribusiness Group	Certified FEP Auditor
Emma Brand	Independent	Certified FEP Auditor

4.3 Summary of FEP Audit Grades

The ASM programme administers a total of 112 FEPs. This is made up of 102 WIL FEPs and 10 Ngāi Tahu FEPs. Ngāi Tahu Farming Limited are WIL shareholders. All Ngāi Tahu properties at Te Whenua Hou have been included and are managed

under the WIL ASM programme. Three of these farms use WIL water and the remainder receive water from water take consent CRC172924 held by Ngāi Tahu Farming Ltd. Ngāi Tahu reports nitrogen discharge compliance for all their properties that do not receive WIL water.

In the 2020-21 season, 33 FEP audits were completed by the auditors, as detailed in Table 2. Because of the Covid lockdowns, some audits were deferred. This has meant that not all properties that were due for an audit were audited. These properties remain a high priority to be audited going forward.

The results of the 33 2020-21 FEP audits are shown in Table 3 below. 97% of the grades awarded were A or B grades. The C grade is discussed in section 4.4 of this report.

Table 3: 2020-21 FEP Audit Results

Grade	Audits Completed	Percentage
A	15	45%
B	17	52%
C	1	3%
D	0	0%
Total	**33**	**100%**

Table 4 shows the current FEP Audit grades for all 112 FEPs managed by WIL.

Table 4: Summary of all Current FEP Audit Grades

Grade	Audits Completed	Percentage
A	38	34%
B	68	61%
C	6	5%
D	0	0%
Total	**112**	**100%**

4.4 Reasons for C Grade and Actions Taken

There was one C grade issued during the 2020-21 audits, which is down from three C grades in 2019-20, eight C grades in 2018-19 and 12 C grades in 2017-18. There were no D grades issued in 2020-21.

Details of the reasons for the C grade issued in 2020-21 and the actions taken to address this are shown in Table 5 below.

Table 5: Summary of C grade reasons and actions

Reasons	Actions
Irrigation management	Prepare and implement an irrigation system regular maintenance schedule Undertaken application depth and distribution uniformity assessments (bucket tests) on those irrigation systems that have not been tested since the last audit
Nutrient management	Create and implement a written winter grazing management plan
Effluent	Identify key effluent management risks and put in place procedures to manage for these risks Undertake a bucket test on effluent irrigator and adjust if necessary to ensure it is applying the correct amount for the soil type
Waterway management	Investigate options around the continual ponding (in the area identified in the previous audit that has now been fenced off) for example, planting flaxes
Point source	Relocate offal pit from its current location because of the risk of ground or surface water contamination

4.5 Farms that have Repeatedly Received C or D Grades

There have been no repeat C or D grades.

All C grades are actively managed with one-on-one interventions by the WIL scheme environmental manager and other advisors as recommended.

4.6 Incidences of Non-Compliance with FEP Requirements

There have been no instances of non-compliance with FEP requirements.

5.0 Progress Achieved by the Scheme

5.1 Implementation of Industry Articulated Good Management Practice

The FEP and audit programme is into the fifth year. Since auditing began during the 2017 reporting year, 98 properties have been audited at least twice, 45 have been audited at least three times and 7 have had a fourth audit, as shown in Table 6 below.

Table 6: Results for 1st, 2nd, 3rd and 4th FEP Audits				
Grade Received	**Audit #1**	**Audit #2**	**Audit #3**	**Audit #4**
A	6.3%	19.4%	24.4%	28.6%
B	63.4%	65.3%	60.0%	71.4%
C	25.9%	14.3%	13.3%	0.0%
D	4.5%	1.0%	2.2%	0.0%
Number of Audits	112	98	45	7

Progressively as the number of audits per farm grow, the achievement of meeting good management practice (A and B grades) improves.

The current FEP audit grades for the scheme are listed in section 4.3 of this report. The improvement in audit grades is most notable with the percentage of A and B grades improving from 68% during the first audit (2017) to 95% in 2021. There are currently only 5% C grades and no D grades.

The progression in audit grades is shown in Figure 1 below.

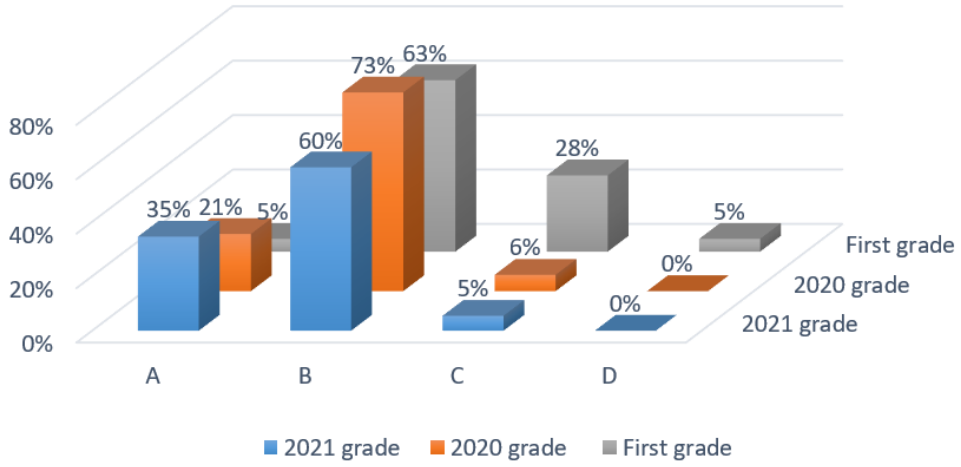

Figure 1: Progression of FEP Audit Grades From 2017 to 2021

5.2 On-farm Improvements

There are a number of on-farm irrigation infrastructure improvements that have been driven by the FEP audit process. The audits have identified and articulated the deficiencies of some irrigation system types may have against the soils or farm system risks.

This has driven change to more efficient irrigation systems. Typically, the high application systems (gun, Rotorainer, K-line, long line) are being replaced with

pivots and fixed grid systems. There is also a small area of underground drip micro being trialled on a property with heavier soils.

5.3 C Grade Properties

There are currently six C grade properties, representing 811 ha, which is less than 3% of the scheme area. Each of these properties are being individually managed to improve their environmental performance.

5.4 Lifestyle Block Holders

There are 60 shareholders with irrigated area of less than 20 ha. This represents 428 ha of irrigation. All lifestyle block holders have a lifestyle block management plan in place.

5.5 Nutrient, Environmental and Water Management System (NEWMS)

Instrumental in implementing GMP has been the introduction of the Nutrient, Environmental and Water Management System (NEWMS) project. A key plank is to require installation of the REGEN soil moisture monitoring and water scheduling management service across the scheme. All properties are required to have at least a minimum of one soil moisture probe and are provided access to local and forecast weather data from MetService. This information, combined with the soil moisture data, is used to provide irrigation event recommendations. All properties have REGEN installed. REGEN has recently been bought by 'CropX' but the service remains.

There has been further investment in weather stations, with 24 stations spread over the scheme area. This provides accurate and localised climate data including evapotranspiration (ET), rainfall and temperature.

The irrigation scheme continues to resource environmental management services than are available to all shareholders.

5.6 Training

Dedicated resources are provided to support farmers with interpreting and prioritising actions following audits. These are provided by Water Strategies, in conjunction with Dairy NZ and Environment Canterbury staff. Training and learning opportunities are targeted at the deficient areas identified through the audit process and targeted at owners and key staff.

Due to Covid restrictions, workshops planned for the beginning of 2021 were postponed. A series of two irrigation manager training workshops were held during October 2021, with repeats being offered in February 2022.

5.7 Biodiversity Projects

The aim of the biodiversity projects is to enable indigenous planting and ecological restoration projects to occur across the WIL scheme, with a specific focus on enhancing the health and connectivity of indigenous flora and fauna at catchment scale across the network and beyond. WIL's approach is to inspire positive action primarily amongst WIL shareholders, but also non-WIL shareholders, by providing guidance, planning and technical input where required to give landowners and community groups the confidence and direction to lead this in their own right, with the ultimate outcome being widely adopted, non-regulatory uptake of such initiatives that are consistent with both regional and national objectives for biodiversity.

There is currently a mixture of projects at different stages with a number of different shareholders across the scheme. These are summarised in Appendix C.

Going forward, WIL's main objective is to leverage the tangible progress that has been made as an example of what can be achieved in order to showcase this to other prospective shareholders and non-shareholders, with one of the overarching outcomes being the establishment of catchment groups to continue the momentum and lead future restoration work.

6.0 Annual Nitrogen Loss

6.1 Schedule A Properties

Table D1 (Appendix D) shows the annual nitrogen loss for the period 1 August 2020 – 31 July 2021 for all properties listed in Schedule A of consent CRC184861.

Table 7 below provides a summary of the nitrogen losses for properties listed in Schedule A for each of the three nutrient allocation zones (NAZs). As shown in Table 7, the current nitrogen losses are less than the consented limits for the Ashley-Waimakariri (red), Ashley (orange) and Waimakariri (green) zones.

Table 7: Summary of nitrogen losses for Schedule A for the period 1 August 2020 – 31 July 2021

	Nutrient Allocation Zone		
	Ashley-Waimakariri	**Ashley**	**Waimakariri**
Consented limit (kg/yr)	2,883,838	168,662	9,416
Aug 2020 - Jul 2021 (kg/yr)	1,483,469	109,089	5,465
% of limit	51%	65%	58%

6.2 Schedule B Properties

At present, there are five properties in Schedule CRC184861B (Schedule B). Details of these resource consents and consented Nutrient Discharge Allowances (NDAs) are shown in Table 8 below. Based on the 2019-20 Overseer modelling, all of the properties list in Schedule B were compliant with their individual NDAs. The farm systems have not changed since last year's annual report; therefore, these five properties are expected to be compliant with their individual NDAs.

Table 8: Summary of properties and nutrient discharge allowances in Schedule B

Consent Holder	Resource Consent Specifying NDA	Consented NDA (kg N/ha)
Eyrewell Dairy Limited	CRC160478	69 (6.3.2)
Keswick Farm Dairies Limited	CRC169538	Red: 36; Orange: 43 (6.3.2)
Carleton Dairies Limited	CRC174943	52 (6.3.2)
Beauhill Trustee Limited	CRC175785	40 (6.3.2)
Schouten Dairies Limited	CRC180289	51 (6.3.2)

Appendix A

Figure

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NO.	REVISION	DATE	BY
A	FINAL	NOV 21	MI

CLIENT

WIL
Waimakariri Irrigation Limited

FIGURE

FIGURE A1: WAIMAKARIRI IRRIGATION SCHEME

PROJECT

WAIMAKARIRI IRRIGATION LIMITED

Appendix B

Audited Self-Management Programme

Waimakariri Irrigation Limited
Audited Self-Management Programme

1.0 Introduction

1.1 Resource Consent

This Audited Self-Management Programme (ASM) has been prepared to satisfy the requirements of WIL's consent CRC184861 (condition 10).

The requirements for the ASM are as follows:

An Audited Self Management Programme (ASM) shall be implemented as follows:

a. *The consent holder shall implement and adhere to an audited self-management programme (ASM), which is developed by a suitably qualified person and approved by the Canterbury Regional Council. The ASM document shall include but not be limited to:*
    i. *Environmental targets and objectives for the scheme and its shareholders;*
    ii. *The proposed monitoring and reporting regime including but not limited to a description of the:*
        a. *FEP audit process and the frequency used to assess individual on-farm progress with the content of any FEP and Appendix CRC184861;*
        b. *Methods used to follow up with shareholders who are not achieving the environmental objectives identified during individual on-farm audits;*
        c. *The proposed data to be collected and reported to the Canterbury Regional Council;*
        d. *Independent annual review of the FEP audit process;*
        e. *How nutrients from all land subject to the scheme or principal water supplier will be accounted for;*
b. *The consent holder shall provide a report to the Canterbury Regional Council describing the performance of the scheme in meeting its environmental targets and objectives by 30 November each year.*
c. *Any significant changes to the ASM document shall be implemented only after approval confirmed in writing by the Canterbury Regional Council.*
d. *FEP audits shall be undertaken by a suitably qualified person at the frequency determined by Appendix CRC184861, with the exception of the first audit, which shall be completed within 12 months of the FEP being completed.*
e. *The consent holder shall prepare an annual report describing the results of the ASM programme and the audits that have been conducted each year. The report shall include:*
    i. *The name of the FEP auditor(s);*
    ii. *A summary of the audit performance grading;*
    iii. *A summary of the reasons for any farm receiving a C or D grade;*
    iv. *A summary of the actions taken to address C or D grades;*
    v. *A summary of farms that repeatedly received a C or D grade;*
    vi. *The progress achieved for previously identified issues, if applicable;*

vii. *The total annual loss of nitrogen from all properties within the Irrigation Scheme or Principal Water Supplier over the reported year.*
viii. *The annual average nitrogen loss to water for each property listed in Schedule CRC184861A and Schedule CRC184861B, as calculated in accordance with Appendix CRC184861;*

f. *A copy of the annual report shall be provided to the Canterbury Regional Council, by 30 November each year;*
g. *The FEP audit records and reports for each property undertaken in accordance with condition 5. shall be kept and supplied to the Canterbury Regional Council upon request.*
h. *The consent holder shall notify Canterbury Regional Council within 20 working days of any exclusion of a shareholder(s) from the ASM programme.*

Figure 1 (Appendix A) shows the extent of the Scheme.

2.0 Environmental Targets

WIL's primary environmental target (in regards to this ASM document) is:

- All shareholders will be at GMP by 1 September 2020

To achieve this target, all farms supplied with WIL water will have an initial FEP by 1 September 2016. By 1 September 2017 the FEPs will include definitive timelines as to how individual farms will be at GMP by 1 September 2020.

Some further environmental targets are:

- All FEPs prepared prior to 1 September 2016 will be audited by 1 September 2017
- All FEPs prepared after 1 September 2016 will be audited within 12 months of being completed
- There will be no D grade audits by 1 September 2018
- There will be no C grade audits by 1 September 2019

3.0 Farm Environment Plans

Farm Environment Plans (FEPs) are the principal tool for the delivery of the good management practice (GMP) outcomes, combined with an auditing process that encourages implementation of GMP measures.

WIL are using two ECan approved FEP templates:

1. All properties larger than 20 ha will complete the WIL online FEP.
2. For properties less than 20 ha in size[1] the ECan developed 'Lifestyle Block Management Plan' (LBMP) is being used. Although discretion is being used if the property warrants a full FEP due to the intensification of land use.

3.1 WIL Online Template

[1] This approach has been endorsed and approved by ECan (see correspondence with PDP and ECan April 2016) as a pragmatic implementation of consent conditions

- The FEP template that is being used is a joint venture between Opuha Water Ltd (OWL) and WIL and a third party technical provider. WIL and OWL jointly own the IP and each scheme have individual access to their program.
- It is an online version that has been approved by ECan for the delivery of the FEPs for the WIL Scheme. All Scheme FEPs must use this template to guarantee consistency.
- It is accessible through the WIL website http://www.wil.co.nz
- Each shareholder/farmer is given a unique username and password to be able to access and manage the FEP for themselves. It is a facilitated process controlled by the Scheme environmental manager or contractor to firstly draft and then finalise the FEP. The final versions are held centrally and will be updated at each audit.
- Copies of all farm plans will be held on file including future iterations of plans to enable monitoring of progress made on individual farms and across the Scheme area as a whole.

3.2 Lifestyle Block Management Plan (LBMP)

- This is an ECan developed template for small scale, low intensity properties that are required to complete a Farm Environment Plan.
- It is available through the ECan website http://ecan.govt.nz/publications/Plans/Lifestyle-block-management-plan-Mar2015.pdf or on request from WIL

WIL have set themselves a target of having all shareholder farms operating at GMP by 1 September 2020. The implementation of this progression towards GMP will be implemented through the FEPs.

3.3 FEP Process

3.3.1 Existing shareholdings

Step 1

Identify the properties where WIL water is used.

Step 2

Categorise the landholding for plan type (FEP or LBMP)

Step 3

Complete a FEP or LBMP - to complete the plan there is no specific requirement as to who carries this out; either land manager, owner, consultant, or with Scheme support. However it must involve the land manager or the person who is designated as the person responsible for implementing the plan.

It must be accompanied by:

a. An "actual" nutrient budget (Overseer® or ECan approved alternative) for the previous production year
b. Farm map in accordance with ECan LWRP Schedule 7

All FEPs and LBMPs must include:

a. All land owned, leased or managed, that is associated with the farming operation both dryland and irrigated. Blocks that are not contiguous and within the WIL command area must also be included
b. All water entitlements associated with any land associated with the operation. For properties that have both WIL water and other consented water takes (groundwater and surface takes), the WIL FEP must include all land area and water sources associated with the

property using WIL water whether it is dryland, irrigated via consented water or irrigated by WIL water.

Step 4

Submit the final[2] FEP/LBMP to WIL

3.3.2 New shareholdings or inclusion of new land area or properties into CRC184861 Schedule A

Before any water movement or transaction is approved by the WIL board of directors, they must first be satisfied the inclusion of new land area and the intended land use and management does not risk making the consents non-compliant.

Step 1

Identify the properties where WIL water is used

Step 2

Categorise the landholding for plan type (FEP or LBMP)

Step 3

Complete a FEP or LBMP (prior to submitting the proposal to the WIL board)

The FEP must include:

a. Provide a predictive nutrient budget (Overseer® or ECan approved alternative) to demonstrate their N losses will be within modelled expectations of the nutrient loss below the root zone.
b. An explanation and management plan of how management practices are going to meet GMP

Step 4

Submit the final FEP/LBMP to WIL

3.4 Overseer Modelling

All shareholders must do annual Overseer modelling, except for properties less than 20 ha in size.

3.5 FEP Review

At the completion of a FEP audit the FEP will be reviewed to monitor progress and ensure improvement towards, or beyond GMP. The reviewed and altered document will be submitted to WIL for recording and reporting purposes. The review is under the expectation that measurable steps are being taken to meet GMP and they will be included into the FEP under the continuous improvement objective.

3.6 Variations

1. When any 'significant'[3] changes are made on-farm, the FEP must be updated within three months of the change. All 'significant' changes must be notified to the Scheme.

[2] As at 10th February 2016 all existing shareholdings and associated properties must have a completed FEP or LBMP before 1st September 2016.

[3] "Significant" changes definition includes change in management personnel, land use, increase in irrigated area, infrastructure upgrades.

2. All water movements whether it is leased, sold, bought or changed use locations must be notified to the Scheme. All new areas must have a new FEP or be included into an existing FEP within three months of change.
3. Those properties less than 20 ha completing a LBMP will not be required to complete a nutrient budget[4] (unless they are associated with a larger operation or by discretion on a case by case basis dependent on land use intensification).

3.7 Guarantees

Shareholders will agree, by signing a commitment statement, that the actions and management practices contained within the FEP suit the nature of their property and land uses, to give a high confidence of achieving the specified objective within an agreed timescale.

4.0 Auditing

4.1 Auditors

WIL will select auditors who meet the definition of a 'Certified Farm Environment Plan Auditor' in proposed Plan Change 5 of the LWRP, which is as follows:

means a person that either (a) is approved by the Chief Executive of Environment Canterbury as meeting the following criteria and is registered on the Environment Canterbury website as a Certified Farm Environment Plan Auditor or (b) is a member of an International Standards Organisation accredited audit programme that has been approved by the Chief Executive of Environment Canterbury as including audit criteria equivalent to that set out in Part C of Schedule 7; and

1. *has at least 5 years' professional experience in the management of pastoral, horticulture or arable farm systems; and*
   a. *holds a Certificate of Completion in Advanced Sustainable Nutrient Management in New Zealand Agriculture from Massey University; or*
   b. *holds a Certificate of Completion in Sustainable Nutrient Management in New Zealand Agriculture from Massey University; or*
   c. *holds a tertiary qualification in agricultural science or demonstrates an equivalent level of knowledge and experience; and*
2. *is a current member of a Professional Institute that requires members to subscribe to a Code of Ethics and has a procedure in place for dealing with complaints made against members; and*
3. *demonstrates, to Environment Canterbury, proficiency in the auditing of Farm Environment Plans against the matters set out in Part C of Schedule 7.*

4.2 Auditing of Lifestyle Blocks

The Scheme recognises that all land associated with the use of Scheme water needs to be treated equally with the same GMP expectations.

Due to the predominantly low intensity nature of the lifestyle blocks they pose a significantly lower risk to the environment than a commercial property. There are however some small blocks that are farmed more intensively.

[4] Nutrient losses from the smaller properties will be accounted for in WIL reporting to ECan based on a predetermined categorisation.

WIL therefore reserves the right to consider what level of investigation is appropriate on a case by case basis.

Requirements

To have an on-site inspection of the property at least once every four years on a rotation. The investigation will look specifically (but not exclusively) at:

- Irrigation management
- Grazing management
- Fertiliser management

This will be carried out by the WIL Environmental Manager or appointed person. The inspection will provide a grade A to D similar to the FEP grading based on a Level of Confidence (LOC) approach.

The LOC approach involves an assessment of the likelihood that each objective and associated targets have been met based on:

- Information provided at the time of audit (actual data, photographs, records, reports)
- Stated practice, provided it can be reasonably justified with other information or evidence
- Observation of actual GMPs
- Stated GMPs supported by evidence
- Nutrient budgets
- Field observation

All grades other than an 'A' will trigger some advice and support from WIL to rectify the issues identified.

This direct approach recognises that often the owners of the lifestyle blocks do not have the skills or knowledge of how to fix a problem or who to ask to help. The expectation will be that once advice is given on how to fix or who to ask for support the owner will follow it up independently of the Scheme.

4.3 Auditing of Other WIL Shareholders (Excluding Lifestyle Blocks)

Requirements

Audits must be undertaken by a suitably qualified person, as defined in section 4.1 of this ASM document.

Audits must be undertaken in accordance with the most recent version of the 'Canterbury Certified Farm Environment Plan (FEP) Auditor Manual'. They will be given a grade A to D based on a Level of Confidence (LOC) approach.

The LOC approach involves an assessment of the likelihood that each objective and associated targets have been met based on:

- Information provided at the time of audit (actual data, photographs, records, reports)
- Stated practice, provided it can be reasonably justified with other information or evidence
- Observation of actual GMPs
- Stated GMPs supported by evidence
- Nutrient budgets
- Field observation

Figure 2 (Appendix A) shows a flow chart of the audit process.

All new FEPs will be audited within one year of completion.

In the subsequent years depending on the grade achieved in the audit the interval between audits shall be no greater than four years. Figure 3 (Appendix A) shows a diagram of the audit interval.

Audit grade	Audit Return interval
A	4 years
B	2 years
C	12 months
D	6 months

For A and B grade audit results, the interval will revert to within 12 months if there is a change in management or a significant change in farm systems. A significant change in farm systems is defined as: "a change in the farm system means whole farm operation conversions, including but not limited to, converting between dairy support, dairy platform, sheep & beef and cropping; and also any introduction of a new stock type to the farm, e.g. deer or wintering dairy cows. Changes such as, varying the type of crop grown or varying the relative proportions of stock types do not constitute a farm system change."

Audit reports must be submitted to WIL within 14 days of completion.

Following the initial audit round finishing on 1 September 2017, the Scheme will select ¼ of 'A' grades and ½ of 'B' grades to begin the next round of audits. The selection of the properties each year until 2020 will be at the discretion of the Scheme and will form the basis of the audit rotation for the following years. This will ensure that all FEPs are reviewed at least twice before the expiry of consent CRC142754.

To determine the selection priority the following criteria may be considered:

- Ability of current infrastructure to meet targets
- Costs and time required to meet GMP
- Staff turnover and training
- Robustness of current management systems
- Current nutrient losses
- Areas of high environmental risk

4.4 Independent Annual Review of the FEP Audit Process

An independent review of the FEP audit process will occur annually.

5.0 Post Audit Process

Following each audit the shareholder/land manager will receive an audit report culminating in a grade. This report will record progress against FEP actions. It can highlight areas where progress against identified actions has not been made and identify any new operational risks that were not recorded in the original FEP or have developed over the preceding time. The audit report will set out any problems that must be acted upon within a specific timescale.

All audit reports and updated FEPs will be kept on file and made available to the shareholder/land manager. These must be retained by the shareholder/land manager and will be used as the basis of future inspections.

The FEP and Audit report will be assessed by the Scheme. Depending on the grade the following responses will occur.

5.1 Farms Achieving 'A' Grade

Shareholders/land managers whose farms that have achieved an 'A' grade will be recorded as making excellent progress toward, or have met, GMP.

Farms in this category will be scheduled for the next audit in four years following the audit, unless there has been a change in management or a significant change in farm systems, in which case the interval will revert to within 12 months.

5.2 Farms Achieving 'B' Grade

Shareholders whose farms have achieved a 'B' grade will be recorded as making good progress.

For those environmental management areas where there is medium level of confidence that the FEP objectives can be achieved the Scheme will assess:

a. Whether the actions in the FEP are specific, measureable, achievable in the timescale and realistic in terms of the level of risk and resources available;
b. If the shareholder/land manager is on-track to implement the actions identified in the FEP; and
c. If what has already been achieved and future actions will lead to a high confidence that the objective is being met.

The assessment on the above criteria will provide a second check and balance to the audit. The Scheme will provide a 'high' 'medium' or 'low' confidence rating that the subsequent audit grade will improve. No further action will be taken but the shareholder /land manager will be recorded as being 'on track', 'static' or 'deteriorating' to achieve the objectives in the FEP.

They will be scheduled for the next audit in two years, unless there has been a change in management or a significant change in farm systems, in which case the interval will revert to within 12 months.

5.3 Farms Achieving 'C' Grade

Shareholders whose farms have achieved a 'C' grade will be recorded as making some progress.

For those environmental management areas where there is moderate confidence that the FEP objectives can be achieved the Scheme will assess:

a. Whether the actions in the FEP are specific, measureable, achievable in the timescale and realistic in terms of the level of risk and resources available;
b. If the shareholder/land manager is on-track to implement the actions identified in the FEP; and
c. If what has already been achieved and future actions will lead to a high confidence that the objective is being met.

The assessment on the above criteria will provide a second check and balance to the audit. The Scheme will provide a 'high' 'medium' or 'low' confidence rating that the subsequent audit grade will improve.

The Scheme will work with or facilitate the shareholder/land manager to identify what improvements can be made toward meeting the objectives in the FEP. They will be required to formulate a management plan within 2 months of the audit with clear timelines and actions they will undertake to meet the FEP objectives and move the audit grade into a 'B' category.

They will be scheduled for a further farm inspection within 12 months.

5.4 Farms Achieving 'D' Grade

A 'D' grade is unacceptable to the Scheme.

Shareholders whose farms have achieved a 'D' grade will be recorded as making poor progress.

All management areas which record a low confidence that the objective is being met will be highlighted as in need of urgent attention. Action will be required immediately to mitigate the risk.

For those environmental management areas where there is low confidence that the FEP objectives can be achieved the Scheme will assess:

a. Whether the actions in the FEP are specific, measureable, achievable in the timescale and realistic in terms of the level of risk and resources available;
b. If the shareholder/land manager is on-track to implement the actions identified in the FEP; and
c. If what has already been achieved and future actions will lead to a high confidence that the objective is being met.

The Scheme will work with or facilitate the shareholder/land manager to identify what improvements can be made toward meeting the objectives in the FEP. They will be required to formulate a management plan within 1 months of the audit with clear timelines and actions they will undertake to meet the FEP objectives and move the audit grade into a 'C' or 'B' category.

They will be scheduled for a further farm inspection within 6 months.

5.5 Repeat 'C' and 'D' Grades

The Scheme wishes to see improvement to be able to meet GMP across all water users. If there are continuous underperforming shareholders/land managers then the following actions will occur.

Discuss and implement constructive options with the shareholders and farm manager to improve performance.

Impose additional charges to recover costs of extra audit management requirements and/or a penalty water charge.

Restrict water supply before other better performing shareholders face restrictions

Longer term water shut off

Terminate Water Supply Agreement

6.0 Exclusion from ASM Programme

If exclusion of any shareholder/land manager from the ASM programme occurs for whatever reason the Scheme will notify ECan within 20 working days from the date the exclusion took effect.

7.0 Non-cooperation or Non-compliance

Different levels can occur. The different levels need to be recognised with appropriate actions. The examples below do not provide an exhaustive list but gives an indication of the sort of non-cooperation or compliance that could occur and the possible sanctions.

Level	Example	Possible Action
One	Failing to provide information	Request for information
Two	Continued non-provision of information following request	Further request
	Nutrient budget not completed	Request completion
	Partial FEP deterioration within an audit interval	Request management plan to rectify
Three	Repeatedly abstracting more water than allowed	Restrict or cease water supply exclusion from program Terminate WS agreement
	Breach of water supply agreement	Restrict or cease water supply exclusion from program Terminate WS agreement
	Repeat C & D audit grades	Restrict or cease water supply exclusion from program Terminate WS agreement
	continued non-provision of nutrient budget	Restrict or cease water supply exclusion from program Terminate WS agreement

8.0 Methods to Assist Environmental Performance Improvements

The Scheme will adopt a pragmatic and supportive approach to enabling improvement. The majority of shareholders/and managers are willing and able to comply with the FEP and audits.

The Scheme and this ASM document place emphasis on improving environmental outcomes through greater resource use efficiency, with the aim of encouraging shareholders/land managers to engage with the Scheme not only for environmental reasons but also to improve the efficiency and economic performance of their businesses.

Being proactive and focusing on the on-farm activities which farmers can control will lead them to being empowered to improve. The compliance aspect will follow as a natural consequence of good practice. Setting up the expectations and making farmers aware of what they need to be doing, recording, working toward, is the first step. Providing information, using good communication to promote awareness of the need and providing accessible templates, guidance and information to enable improvement. Appendix B provides a list of the support being provided.

A successful compliance model is fair, reasonable, consistent and transparent in the process. Where it is appropriately implemented, shareholders/land managers are more likely to make the permanent changes required to consistently perform at a higher standard. There is a fall-back position of sanctions if needed but the preferred approach is to work proactively with shareholders and land managers sympathetically with their businesses.

The aggregation of data and actions needed from the FEPs will provide steer on what management actions need to have resources, support and training developed or sourced to improve the issue.

The Scheme has made ongoing provision and has contracted an environmental manager to manage the delivery of the ASM and the FEP programme. This direct and dedicated contact point has not been available in the past.

9.0 Reporting

WIL will prepare an annual report describing the performance of the Scheme in meeting its environmental targets and objectives.

The report shall include:

i. The name of the FEP auditor(s);
ii. A summary of the audit performance grading;
iii. A summary of the reasons for any farm receiving a C or D grade;
iv. A summary of the actions taken to address C or D grades;
v. A summary of farms that repeatedly received a C or D grade;
vi. The progress achieved for previously identified issues, if applicable;
vii. The total annual loss of nitrogen from all properties within the Irrigation Scheme or Principal Water Supplier over the reported year.
viii. The annual average nitrogen loss to water for each property listed in Schedule CRC184861A and Schedule CRC184861B, as calculated in accordance with Appendix CRC184861;

This report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by the 30 November each year.

10.0 Changes to this ASM Document

Any significant changes to this ASM document shall only be implemented after approval confirmed in writing by the Canterbury Regional Council.

Appendix A: Figures

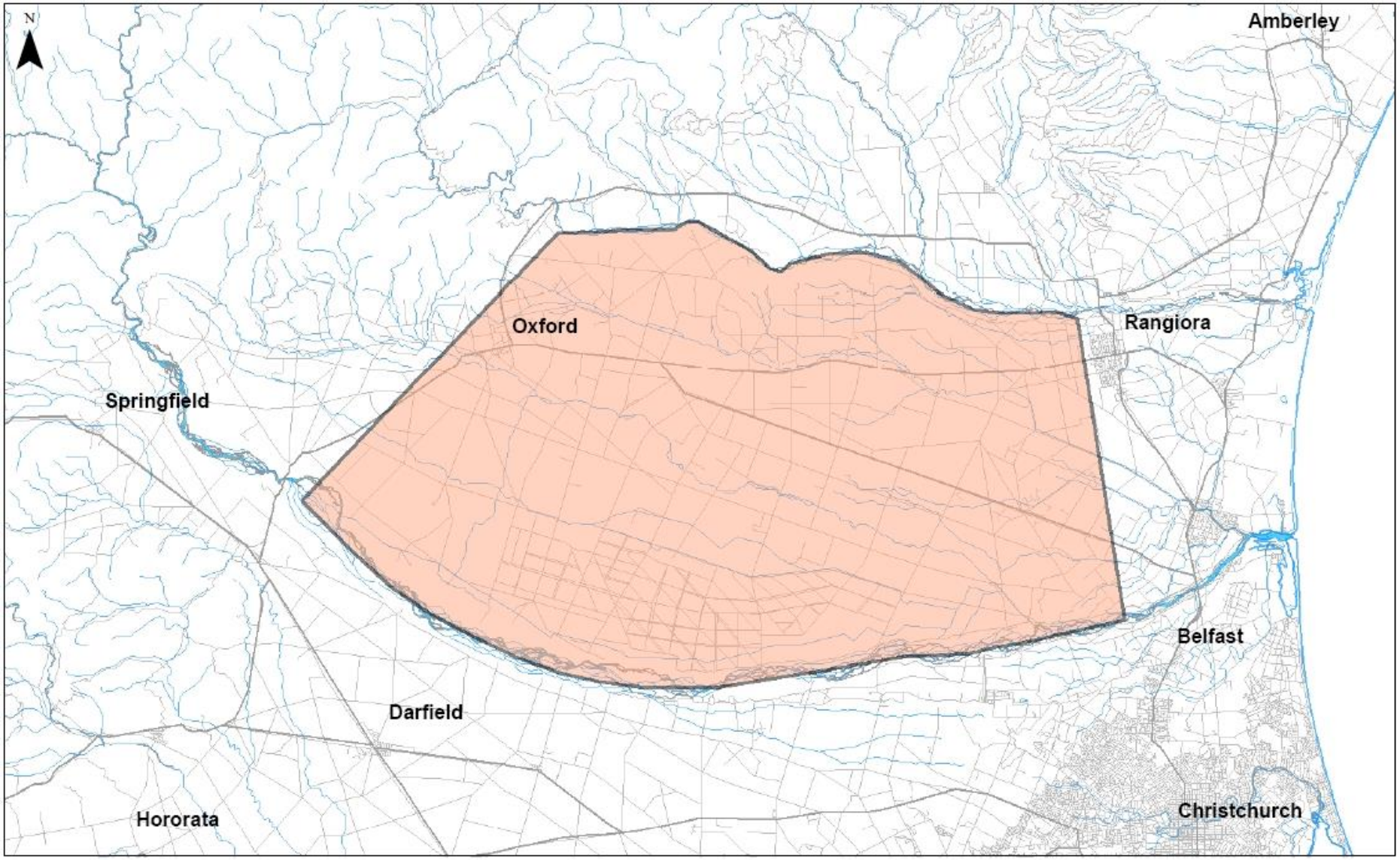

Figure 1: Waimakariri Irrigation Scheme

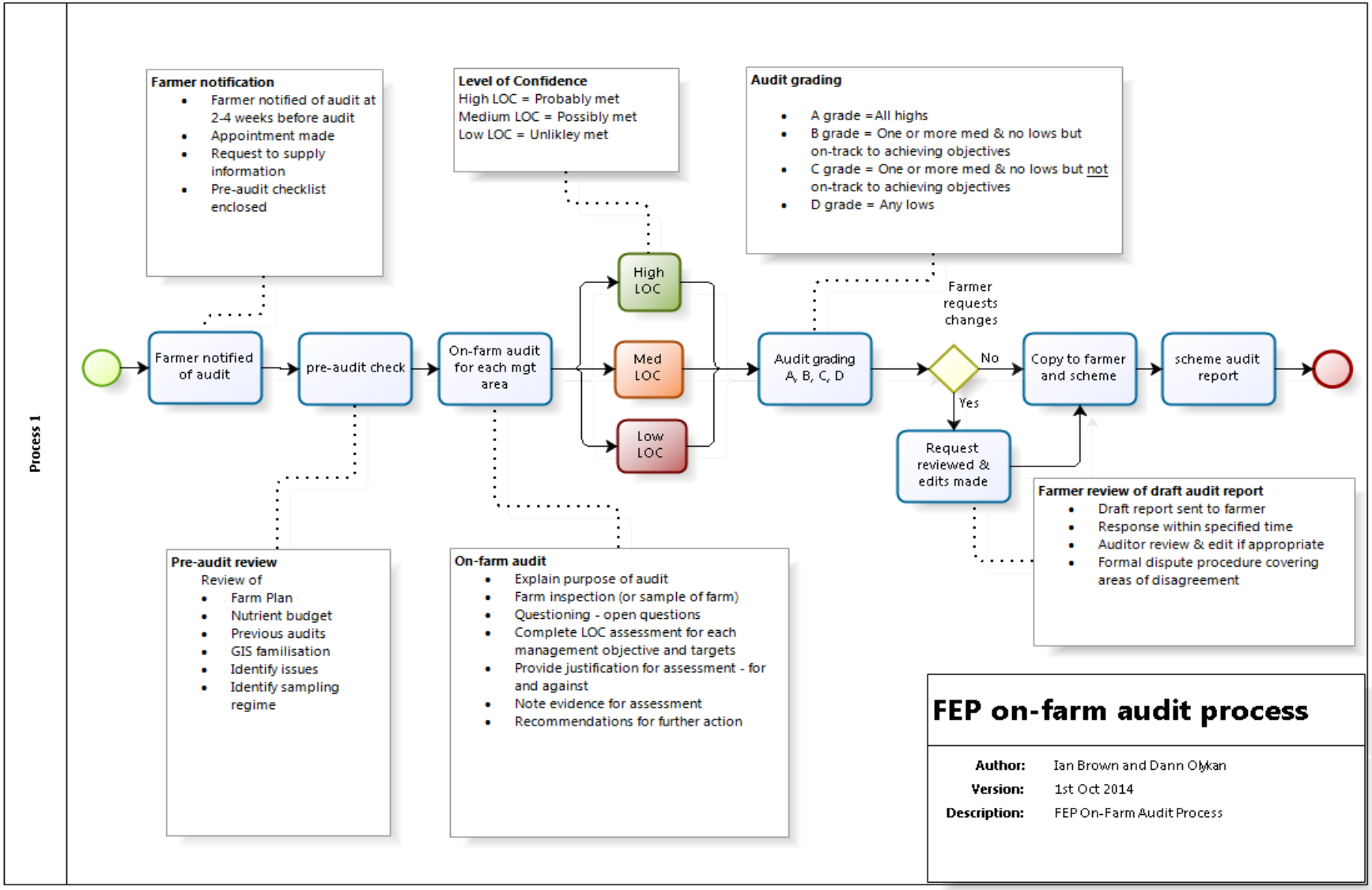

Figure 2: FEP on-farm audit process

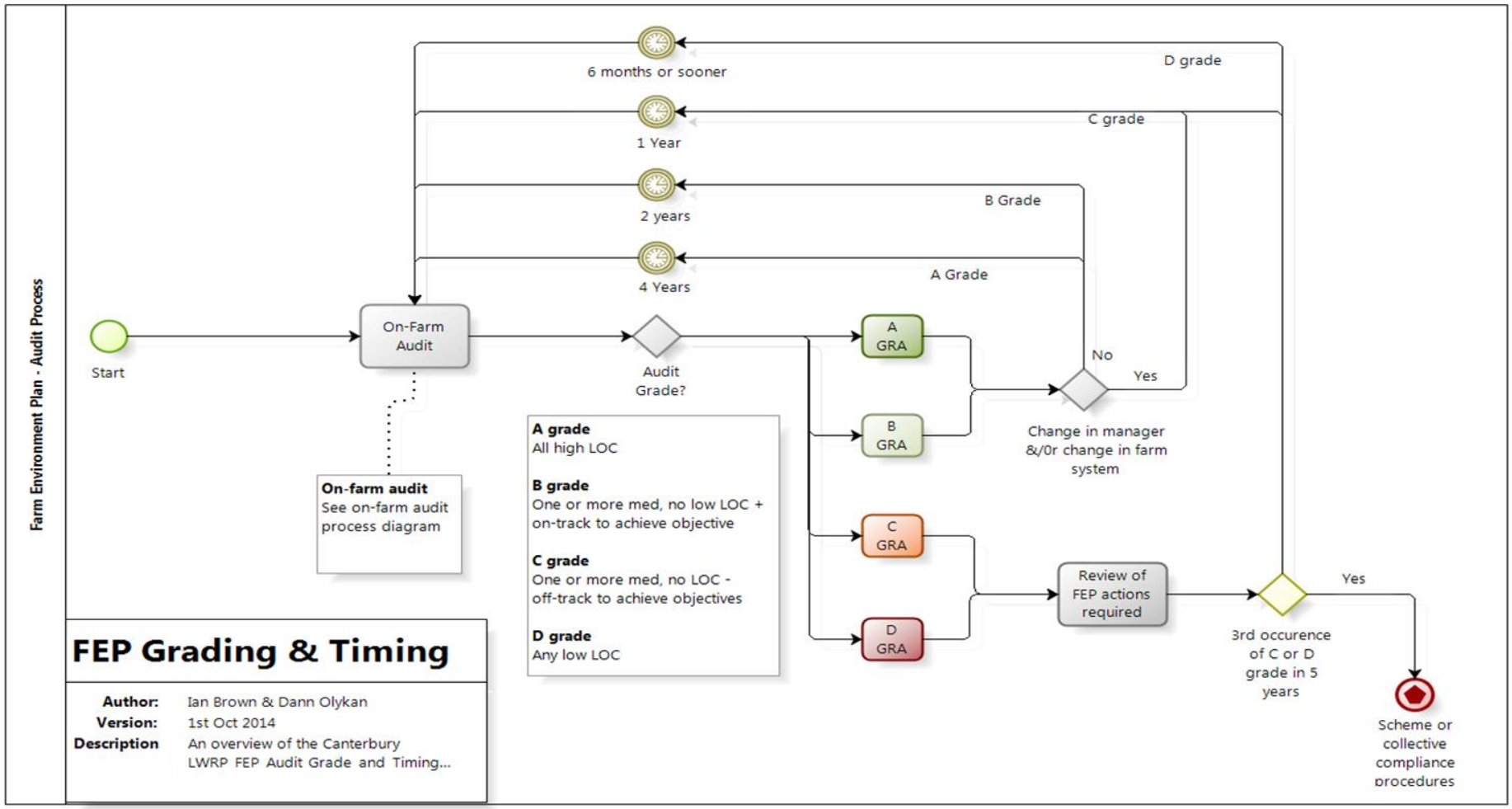

Figure 3: FEP grading and timing

Appendix B: Support for WIL Shareholders

Systems

- Simple online systems
- Provide user-friendly and useful templates
- Provide checklists and record sheets

Support

- Collate and make available useful information, especially from other industry bodies
- Simplifying and communicating GMP
- Be available for one on one advice
- Translate requirements into actions

Facilitation

- Facilitate learning through sharing information with others, such as farm focus days
- Enable sharing of research
- Work with other industry bodies to be consistent

Research

- Communicate latest research to interested Shareholders
- Invest and support research initiatives

Communicating Sucess

- Celebrate success
- Communicate progress and meeting of milestones

Appendix C

Summary of Biodiversity Projects

Project Name	Project Summary	Location	Status
Cust River catchment enhancement	1,300 m^2 of native filtration planting + 500 m of Riparian planting at strategic points along on-farm waterways to enhance biodiversity and help mitigate risks to freshwater	Cust River catchment, Summerhill	Planting completed late 2019. Further planning & survey now underway for ongoing planting
	1.2 ha of riparian planting to enhance a waterway corridor with an estimated 2,569 seedlings + a further 1 ha of constructed wetland to enhance water quality with an estimated 4,718 seedlings. Discussions being undertaken with neighboring farm around possible further cross-boundary planting	Cust River catchment, Oxford	Planning completed. Seedlings being grown on-farm. discussions with Council to be completed regarding planting on drainage reserve & any other possible assistance
Burgess Stream Headwaters Restoration & Protection	Approximately 1 ha wetland & riparian restoration planting with an estimated 2,517 native seedlings to be planted. Landowners are dairy farmers straddling a natural lowland waterway who have made clear they are keen to continue planting along their section of the stream and to involve other landowners in the area	Burgess Stream, Mandeville/West Eyreton	Planting 90% completed with remainder to be planted before end of 2021
	2.6 ha along 3 natural waterways & 4 Springs identified for future native planting	Burgess Stream, Mandeville/West Eyreton	Planning completed, funding support to be sought 2022
	7,500 m^2 of indigenous planting along 750 m of riparian margin	Burgess Stream, Mandeville/West Eyreton	Planning completed, meeting scheduled with shareholder for late November to discuss implementation
Burnt Hill Native Afforestation	14.4 ha of hillside country earmarked for indigenous forest planting with an estimated 39,000 native seedlings over 10 years for emissions offsetting & erosion control	Burnt Hill, Oxford	Detailed planning completed. Landowner discussions ongoing
	"Offline" pond fed by race water to create alternative habitat for indigenous freshwater species at times of low-flow in the race network, specifically Long & Shortfin Eels. This concept was also used to provide a series of educational opportunities for students of the nearby West Eyreton School. This project is now being led & managed by the landowner with ongoing involvement from the school	Race 3D, West Eyreton	Landowner currently progressing
Hunters Stream restoration & protection	2 ha of on-farm indigenous wetland & riparian planting on a mixture of springs and natural waterways in the headwaters of the Hunters stream consisting of approximately 12,300 seedlings. Both the landowners (WIL shareholders) and their neighbors (non-WIL shareholders) have indicated they are keen to undertake adjoining riparian & wetland planting across their property boundaries, and to take up roles in a proposed future catchment group to improve & further mitigate risks to water quality	Hunters Stream, Cust	Planning completed. Discussions with neighbors regarding extended planning/planting TBC
	Creation of 2.8 ha of riparian margin & indigenous forest patch through the planting of approximately 11,400 native seedlings to enhance water quality, in-stream ecological values & indigenous biodiversity	Hunters Stream, Springbank	Planning completed. Farm redevelopment work underway with new riparian margins currently being fenced out
Springvale wetland protection & enhancement	Approx. 500 m^2 of riparian stock exclusion & planting of WIL-fed waterway entering the wetland	Springvale Wetland, Summerhill	Planning currently in progress
Eyre River tributaries restoration & protection	Collective farmer-led action on waterway enhancement through riparian planting & wetland creation to enhance water quality, in-stream ecological values & indigenous biodiversity	Eyre River, Oxford/Starvation Hill	Aerial mapping & shareholder engagement currently underway

Appendix D

Nitrogen Loss Tables

Table D1: Annual Nitrogen Losses for the Period
1 August 2020 - 31 July 2021

	Nutrient Allocation Zone Mass Nitrogen Loss (kg/yr)		
Property number	Ashley-Waimakariri	Ashley	Waimakariri
1	3,624	0	0
2	9,936	0	0
3	4,920	0	0
4	1,112	0	0
5	39,780	0	0
6	3,408	0	0
7	65,560	0	0
8	25,695	0	0
9	102	0	0
10	11,150	0	0
11	2,033	0	0
12	236	0	0
13	513	0	0
14	25	0	0
15	228	0	0
16	25	0	0
17	3,780	0	0
18	4,397	0	0
19	113	0	0
20	9,286	0	0
21	7,437	0	0
22	9,691	74	0
23	15,516	118	0
24	17,652	135	0
25	13,199	0	0
26	2,504	0	0
27	15,290	0	0
28	22,575	0	0
29	15,686	0	0
30	11,096	0	0
31	508	0	0
32	279	0	0
33	8,176	0	0
34	0	16,571	0
35	0	8,700	0
36	0	10,794	0
37	7,952	0	0
38	28,638	0	0
39	5,865	0	0
40	18,834	11,528	0
41	2,506	2,834	0
42	19,998	0	0
43	1,572	3,657	0
44	508	0	0

45	716	0	0
46	7,078	0	0
47	51	0	0
48	102	0	0
49	1,228	569	0
50	203	0	0
51	1,880	0	0
52	9,005	0	0
53	508	0	0
54	1,956	0	0
55	35,400	0	39
56	22,496	0	0
57	5,242	0	0
58	16,038	0	0
59	19,734	0	0
60	5,200	0	0
61	12,032	0	0
62	10,168	0	0
63	472	0	0
64	263	0	0
65	286	286	0
66	1,362	0	0
67	378	0	0
68	381	0	0
69	610	0	0
70	254	0	0
71	103	0	0
72	12,851	0	0
73	12,806	0	0
74	609	0	0
75	65,545	0	0
76	206	0	0
77	178	0	0
78	182	0	0
79	5,136	0	0
80	213	0	0
81	6,244	0	0
82	9,570	0	0
83	610	0	0
84	55,124	0	0
85	558	0	0
86	2,100	0	0
87	2,600	0	0
88	13,711	0	0
89	1,778	0	0
90	1,126	0	0
91	26,709	13,191	0
92	407	0	0
93	22,382	0	0
94	3,825	0	0

95	1,434	0	0
96	1,295	0	0
97	195	0	0
98	51	0	0
99	15,120	0	0
100	254	0	0
101	10,149	2	0
102	254	0	0
103	508	0	0
104	19,986	0	0
105	21,750	0	0
106	21,024	0	0
107	15,962	0	0
108	102	0	0
109	115	0	0
110	508	0	0
111	6,188	0	0
112	7,082	0	0
113	973	0	0
114	20,700	0	0
115	28,415	0	0
116	13,790	0	0
117	506	0	0
118	1,056	0	0
119	0	305	0
120	0	2,872	0
121	102	0	0
122	102	0	0
123	16,560	0	0
124	28,659	0	0
125	7,661	0	0
126	0	1,160	0
127	19,056	0	28
128	31,730	0	0
129	508	0	0
130	610	0	0
131	76	0	0
132	1,408	0	0
133	127	0	0
134	122	0	0
135	127	0	0
136	10,917	0	5,398
137	163	345	0
138	6,324	0	0
139	2,790	0	0
140	2,184	0	0
141	4,115	0	0
142	2,460	0	0
143	30,128	0	0
144	2,019	0	0

145	1,727	0	0
146	661	0	0
147	5,328	0	0
148	106	0	0
149	1,016	0	0
150	103	0	0
151	660	0	0
152	128	0	0
153	511	0	0
154	762	0	0
155	1,463	0	0
156	38,371	0	0
157	25,920	0	0
158	6,688	0	0
159	14,784	0	0
160	0	610	0
161	12,880	0	0
162	411	0	0
163	11,520	0	0
164	711	0	0
165	838	0	0
166	1,189	0	0
167	414	0	0
168	700	0	0
169	787	0	0
170	2,072	2,713	0
171	10,600	0	0
172	15,799	0	0
173	127	0	0
174	334	0	0
175	22,503	0	0
176	936	0	0
177	4,437	0	0
178	3,770	0	0
179	571	0	0
180	6,195	0	0
181	29,183	0	0
182	408	73	0
183	178	0	0
184	102	0	0
185	43,920	0	0
186	150	0	0
187	2,718	0	0
188	102	0	0
189	14,684	7,552	0
190	11,093	5,705	0
191	0	17,110	0
192	102	0	0
193	144	0	0
194	8,590	1,127	0

195	562	74	0
196	3,173	0	0
197	102	0	0
198	357	0	0
199	508	0	0
200	1,350	0	0
201	315	0	0
202	6,324	984	0
	1,483,469	**109,089**	**5,465**