FEP ID #	**FEP16 Marchwood**
FEP Offtake #	**GS3 & GS4**
FEP Date	**Jan 2021**
Last Audit Grade	**2**
Last Audit Date	**11/2017**

North Otago Irrigation Company Ltd

Delivering Opportunities Together

Vision:
To be a strong, adaptable water infrastructure company.

Mission:
To deliver cost-effective, reliable water, be committed to environmental leadership and enable positive social and economic outcomes.

PART A

RECOMMENDED ACTIONS AND TIMEFRAME TO COMPLETE
RECORDS NEEDED
FARM INFORMATION
RISK SUMMARY
COMPLIANCE REPORT

PART B MANAGEMENT PLANS (if applicable)

- IRRIGATION MANAGEMENT PLAN
- NUTRIENT & SOILS MANAGEMENT PLAN
- INTENSIVE GRAZING PLAN
- EFFLUENT MANAGEMENT PLAN
- WATERBODIES AND CSA MANAGEMENT PLAN
- BIODIVERSITY, BIOSECURITY &CULTURAL VALUES PLAN
- GHG MANAGEMENT PLAN

PART C MAPS

- FARM PADDOCK MAP
- CSA MAP
- PHOTOS

RECOMMENDED ACTIONS TO MEET GMP

MANAGEMENT AREAS	ACTIONS AND RECORDS (add or delete if no applicable)	DUE DATE
Irrigation Actions	● Staff involved with irrigation attend irrigation field workshop ● Ensure overwatering is not occurring with one day shifts of kline especially in regard to infiltration rates ● Bucket tests on pivots – rain gauges on guns and kline	● ASAP ● Ongoing ● By audit
Irrigation records (paper or electronic) needed for Audit	● Bucket Test results ● Daily recordings ● Maintenance checklists ● NOIC Irrigation Workshop attendance certificates	● At Audit
Nutrient and Soil Actions	● Ensure proof of placement maps show consideration of CSAs ●	●
Nutrient records (paper or electronic) needed for Audit	● Nutrient Budget ● Fertiliser plan ● Soil tests results ● Fertiliser Application records and proof of placement maps	● At Audit
Intensive Grazing Actions	● Fill in grazing plans (template page 12) ● Ensure compliance with National and Regional Rules	● By Audit
Intensive Grazing records (paper or electronic) needed for Audit	● Grazing plans ● Intensive Grazing Resource consent (if applicable)	● At Audit
Effluent Management	● Comply with Plan Change 8 effluent rules when operative ●	● When applicable
Effluent records (paper or electronic) needed for Audit	● ORC and supplier inspections ● DESC calculation if possible ● Effluent Resource Consent (if applicable)	● At Audit
Waterbody and CSA Management Actions	●	●
Waterways and CSA records (paper or electronic) needed for Audit	● Farm Risk Map and FEP CSA map (part of the FEP)	●
Point Source Management Actions	●	●

Biodiversity, Biosecurity Management	•	•
Biodiversity records	• Riparian Plan (consider DNZ riparian planner)	Recommendation only
Cultural Values Management Actions (Mahinga kai and Rock Art)	•	

CONTACT INFORMATION

Property Name	Marchwood			**Physical Address**	371 Glen Settlement Road
Owner	Blair and Sarah Hamilton				
Postal Address	74b Ngapara/Georgetown road				
Landline		**Mobile**		**Email**	
Farm Manager or Lessee (circle)	Kris Fisher				
Postal Address	371 Glen Settlement road				
Landline		**Mobile**	027 261 1451	**Email**	marchwoodlimited@gmail.com
Contact details other	Paul Edmondston paul@3drural.co.nz 0274585382				
Person responsible for day to day Farm Management and FEP	Kris Fisher				
Supplier number	36215				

PROPERTY INFORMATION

Property total (Ha)	453	**Effective Area (Ha)**		**Lease blocks (Ha)**		**Lease Effective (Ha)**	
Legal Description	Lot 2 Deposited Plan 1999, Lot 1 Deposited Plan 1999; Part Section 2S Glenn Settlement, Part Section 11 and Part Section 16 Block V Awamoko Survey District,						
Farming Enterprise	Dairy						
Resource Consents							
Soils	Ngapara						
Catchment Area	Waikoura		**NOSLaM pod**			**Annual Rainfall**	
Overseer version		**Company**		**Person**		**Date**	
N loss (kg/ha/yr)		**P loss (kg/ ha/yr)**		**GMP loss rate & Baseline GMP loss rate (Canterbury farms)**			
Additional Property Information							

IRRIGATION INFORMATION

Total Irrigated Area (Ha)		**No of NOIC shares held**		**Name of Shareholder**		**Other water takes /sources**	
Pivot (Ha) **Design Plans**	144	**No. Pivots**	3	**Kline (Ha)** **Permission to access Plans Y/N**	230	**Irrigation Other (Ha)** • 2ha Fixed grid	
Soil Moisture Monitoring (type)	Hydrosense			**SMM sites (i.e. amount, paddocks)**			

EFFLUENT INFORMATION

Effluent Consent no	N/A	**Effluent Storage type/system**	Weeping wall to clay pond	**Designed to industry code**		**DESC Calculation**	
Discharge (Ha)	144	**Application type**	Through pivots	**Drop test due date**		**EWOF (Y/N)**	
Effluent Management Plan Y/N		**EMP Date and comments**					
Effluent Comments							

WATERWAYS & BIODIVERSITY

Permanent Waterways	N	**Wetlands**		**CSA Mapping Y/N**	N	**Riparian Planting Plan**	
Comments							

FARM INFORMATION

Dairy cows (peak)	1100	**Dairy Wintered off**		**R1s and R2s**		**Dairy other**	
Deer		**Stock other**		**Crops (type and ha)**			
Plantation Block (Ha and type)		**Riparian (Ha)**		**Other**			

RISK SUMMARY

Risk	Rating (L,M,H)	Location Risk	Infrastructure Risk	Personnel Risk	Summary
Irrigation Risk	•	•	•	•	•
Nutrient & Soil Risk	•	•	•	•	•
Intensive Grazing Risk	•	•	•	•	•
Effluent Risk	•	•	•	•	•
Waterways & CSA Risk	•	•	•	•	•
Point Source Risk	•	•	•	•	•
Biodiversity, Biosecurity Risk	•	•	•	•	•
Water Use (excluding irrigation)	•	•	•	•	•
Cultural Values Risk	•	•	•	•	•
Summary					

Responsibility for Implementing the Farm Plan			
As the person responsible for implementing this plan, I confirm that the information provided is correct:			
Name (Plan implementer)		**Signature**	
Position (e.g. owner/manager)		**Date**	

Owner and lessee commitment						
As owner/s of this farming business I/we are committed to ensuring that all activities on this property are undertaken in an environmentally sustainable manner with cultural values considered and cultural outcomes delivered. We agree to monitor our performance in meeting the management objectives and outcomes in this Plan, and take appropriate actions to address any areas where improvement is needed.						
Name (Owner or representative)		**Signature**			**Date**	
Name (Lessee or representative		**Signature**			**Date**	

IRRIGATION MANAGEMENT PLAN

The amount and timing of irrigation is managed to meet plant demands, minimise risk of leaching and runoff and ensure efficient water use.

Property Name: Marchwood
Person responsible for implementing this Plan: Kris Fisher
Date: Feb 2021
Contacts for breakdowns and maintenance:

Target 1: New irrigation systems are designed, and installed in accordance with industry codes of practice and standards.	**Records**
• Proposed fixed grid	•

Target 2: The timing and depth of irrigation water applied takes account of crop requirements and is justified through soil moisture monitoring or soil water budgets and climatic information.	
2.1 Timing and Depth:	
1) PAW of soils: **2) Predominantly:** **3) Ngapara – Well drained** **4) 30cm depth 58mm PAW (high)** **5) Decision making based on: Hydrosense portable probe** **6) Irrigation Areas application rate:** • 32mm green/yellow sprinklers 10 day return time • Pivots 5mm a day **7) Application depth adapted to meet PAW of soil by** • Sprinkler colours dictate once or twice daily shifts of kline • Fixed grid installation ***<u>Profile available water (PAW)</u>*** *The amount of water potentially available to plant growth that can be stored in the soil to cm depth.* *Plants can only extract water where roots can grow.* *30 cm is available to the widest range of crops, including shallow-rooting grasses and crops.*	• Soils map
2.2 Irrigation Decisions	**Records**
Environmental Risk Assessment – where are risk areas on farm? Strong knowledge of risk areas. Most areas have been fenced off and fixed grid has been installed	• Map
Incident report procedure: 1)	• Record any incidents
Target 3: The performance of irrigation systems, is assessed annually and irrigation systems are maintained and operated to apply irrigation water at their optimal efficiency.	**Records**

3.1 System Assessment	
○ Bucket tests for pivots ○ Rain gauge checks for kline and gun	● Bucket test results
3.2 Maintenance	
○	● Preseason checklists ● Service ● Maintenance
3.3 Operating Procedures	**Records**
Daily Procedures ○ Weather forecast is checked ○ Recording: - Whats app	● Rainfall ● Application rate ● Incidents ● Maintenance
Target 4: Staff are trained in the operation, maintenance and use of irrigation systems	
4.1 Staff training on farm	
○	● Signed on farm training
4.2 Staff training off farm	
○	● Certificates

Recommended actions to meet objectives and targets for Irrigation Management	Date
● Staff involved with irrigation attend irrigation field workshop ● Ensure overwatering is not occurring with one day shifts of kline especially in regard to infiltration rates ● Bucket tests on pivots – rain gauges on guns and kline	ASAP Ongoing

NUTRIENT & SOIL MANAGEMENT PLAN

1) *Use nutrients efficiently and **minimise nutrient losses to water** and do not exceed any consented limits or regional rules*
2) *The physical and biological condition of soils is maintained or improved to **minimise the movement of sediment, phosphorus, and other contaminants** to waterways*

Property Name:
Person responsible for implementing this Plan:
Date:

Target 1: Nitrogen losses from farming activities are at or below the: **(a) (ECan region) Baseline GMP Loss Rate or Good Management Practice Loss Rate (whichever is the lesser) or** **(b) (Otago region) consented nitrogen loss limits**	**Records**
1.1 Understanding N loss on farm	
o Within 190kg N limit.	
o All changes (fixed grid introduction) reduce nutrient loss so Overseer is not updated.	• Nutrient Budget
1.2 Available nitrogen loss mitigation measures (excluding those associated with irrigation, fertiliser or effluent management) are implemented	
o	
Target 2: N Fertiliser Management: amount, timing and application of fertiliser inputs applied to match the predicted plant requirements and minimise nutrient losses	**Records**
2.1 N fertiliser rates	
1) N fertiliser decisions guided by : o Kerry Galvin Ballance 2) **N fertiliser rates and times:** o 150kg/N/ha/year o SustaiN in spring, hen manure	• Fertiliser plan • Soil tests results • Fertiliser Application records
2.2 N fertiliser application	
o N fertiliser spread on farm using Tow n Fert which makes it easy to calibrate how much fertiliser is spread per hectare and reduces volatisation. o Proof of placement via Field Navigator trial of phone app.	• Proof of placement maps show consideration of CSAs
2.3 N fertiliser timing	
o No fertiliser is spread during winter months o No N fertiliser spread on saturated or compacted soils	• Fertiliser Records •
2.4 Store and load fertiliser to minimise the risk of spillage, leaching and loss into water bodies	

o No fertiliser is stored	●

Target 3: Phosphorus and sediment losses from farming activities are minimised.	**Records**
3.1 Understanding P and sediment loss on farm	
o	● CSA Map
o	
3.2 Farming activities are managed so as to not exacerbate erosion	
o	● CSA Management Plan
3.3 Farming practices are implemented that optimise infiltration of water into the soil profile and minimise run-off of water, sediment loss and erosion – reduce compaction	
o	●
Target 4: Phosphorus Fertiliser Management: amount, timing and application of fertiliser inputs applied to match the predicted plant requirements and minimise nutrient losses	**Records**
4.1 P fertiliser rates	
1) P fertiliser decisions guided by : o Advisors, soil tests, crop calculators **o** **o P fertiliser rates and times:** **o** **o**	● Soil test results
o Olsen P at optimum levels:	
4.2 P fertiliser applications	
o	● Proof of placement maps show consideration of CSA map
4.3 P Fertiliser Timing	
o	●
Recommended Actions to meet objectives & targets for Nutrient Soil Management	**Date by**
o	●

INTENSIVE GRAZING MANAGEMENT PLAN

Annual forage crop means a crop, other than pasture, that is grazed in the place where it is grown

Minimise Nitrogen, phosphorus, sediment and other contaminants to waterways and any adverse effects to soil condition

Property Name:
Person responsible for implementing this Plan:
Date:

Target 1: Compliance	**Records**
• Ensure compliance with National and Regional Rules	• Resource consent.
Target 2: Paddock Selection – if possible	**Records**
• Paddocks with waterways, CSAs and slopes above 15 ° are avoided • If risk paddocks unavoidable a grazing plan is in place to mitigate risk (see over page)	
Target 3: Cultivation	**Records**
• Cultivation occurs across slope if safe to do so • Paddocks with CSAs, wet areas or waterways ensure an appropriate buffer is left in grass when sowing crop	
Target 4: Grazing Management	**Records**
• See grazing plans • **Pugging is minimised and run-off avoided by:** • Buffers of at least 3m beside a CSA or • Contingency plan for adverse weather • On-off Grazing if needed	• Grazing Plans • Photos

Recommended Actions to meet objectives and targets for Intensive Grazing Management	**Date by**
• Submit plans to council annually. • Ensure compliance with National and Regional Rules	

CSAs (Critical Source Areas) are small, low-lying parts of farms, that are often wet or have intermittent flow, such as gullies and swales. These areas may be hotspots for nutrient, sediment, and bacterial run-off.

Intensive Grazing Paddock Grazing plan

Draw paddock shape below and include the following:

- Show CSAs or waterways if any
- Show direction of grazing
- Position of trough (if applicable)

Paddock:
Ha:
Crop:
●**Target 4** Grazing Management for this paddock: (list below, refer to target 4 on first page)

●Position of baleage

EFFLUENT MANAGEMENT PLAN

Animal effluent and solid animal waste is managed to <u>minimise nutrient leaching and run-off</u>

Property Name:
Supplier number:
Person responsible for implementing this plan:
Date:
Contacts for breakdowns and maintenance: ●

Target 1: Effluent systems meet industry Codes of Practice or an equivalent standard and effluent systems and management are compliant with regional rules	**Records**
1.1 Systems meet industry standards	
●	
1.2 Compliance	
● To be compliant with Regional Council plan Change 8 rules. ● Drop test and visual inspections complete. ● DESC and effluent management plan to be completed prior to consent application. ● To be compliant with supplier inspections and ORC shed inspections	● Council inspections ● Supplier inspections ● Resource consent (if applicable)

Target 2: <u>Sufficient and suitable storage</u> is available to enable animal effluent and wash-down water to be stored when soil conditions are unsuitable for application	**Records**
2.1 Storage system and design	
● ● Solids:	
2.2 Storage Management	
○ 50 days	● DESC Calculation ● Site inspection

Target 3: The timing and rate of <u>application of effluent and solid animal waste</u> to land is managed so as to minimise the risk of contamination of groundwater or surface water bodies	**Records**
3.1 Application Area Ha___144Ha___	**Evidence/records**
● Application explained: ● Through pivots injected ○	● Effluent Area (map) ● Bucket tests ● Application records ● Nutrient Budget (effluent blocks)
3.2 Application Depth	
● Of the 10mm application effluent is no more than 5mm mixed with water	

●	
3.3 Environmental Risk	
○ E.g See 'Effluent risk map' for monitoring points ○ Alarm	
3.4 Incident procedures	
● **What to do when:** ●	
3.3 Operations	Records
● Standard operating procedures ● Weather ● SMM ● Recording	
3.5 Maintenance (examples below or refer to existing ones)	**Records**
Daily **Weekly** **Monthly** **Annually**	● Maintenance checklists

Target 4: Staff are trained in the operation, maintenance and use of effluent storage and application systems	
o	●

Additional Actions needed to meet Objectives and Targets in Effluent Management	**Date by**
o Replace this Effluent Management Plan for Plan Change 8 rules o To be compliant with Regional Council plan Change 8 rules when operative	

WATERBODIES AND CSA MANAGEMENT PLAN

(Wetlands, riparian areas, swales, springs, drains, rivers, and lakes)

Wetlands, riparian areas, springs and the margins of surface waterbodies are managed to avoid damage to the bed and margins of the water body, and to avoid the direct input of nutrients, sediment, and microbial pathogens

Target 1: Stock are excluded from waterbodies and high-risk CSAs in accordance with irrigation company policy, regional council rules or any granted resource consent	**Records**
1.1 List of waterbodies and CSAs with stock exclusion requirements – see CSA map	
• **Waterways:** • No permanent waterways • **CSAs (numbered see CSA Map):** • CSAs fenced	• CSA Map
Target 2: Vegetated riparian margins of sufficient width are maintained, and other mitigations are implemented to minimise nutrient, sediment, and microbial pathogen losses to waterbodies and high-risk CSAs	**Records**
2.1 Managing risk areas and mitigating run-off – see CSA map	
• Buffers and sediment traps see CSA map	• Riparian Plan • CSA Map
Target 3: Farm tracks, gateways, water troughs, self-feeding areas, stock camps wallows and other farming activities that are potential sources of sediment, nutrient and microbial loss are located so as to minimise the risks to surface water quality	
o Farm tracks cambered and maintained annually o Water tables have cut outs to spill any rainfall run-off onto paddocks ○ Gateways and troughs are maintained with gravel ○ All other risk areas have buffer zones implemented	• Proof of placement maps • Photos
Target 4: Mahinga kai values are protected as a result of measures taken to protect and enhance water quality and stream health	
• Yes	
Additional Actions to meet Objectives and Targets in Waterways and CSA Management	**Date by**
•	• Ongoing

CSAs (Critical Source Areas) are small, low-lying parts of farms, that are often wet or have intermittent flow, such as gullies and swales. These areas may be hotspots for nutrient, sediment and bacterial run-off.

POINT SOURCE MANAGEMENT (to be filed under Waterway and CSA management)

(Offal, rubbish and silage pits and stacks)

The number and location of pits are managed to minimize risks to health and safety and water quality

<u>Silage:</u> All on-farm silage, discharges are managed to avoid direct discharges of contaminants to groundwater or surface water	**Records**
○	Site visit
<u>Offal Pits:</u> All on-farm offal pit discharges are managed to avoid direct discharges of contaminants to groundwater or surface water	
○ Offal Pits constructed as per Regional Council rules ○ Offal pits are constructed where there is no risk of contamination of ground or surface water or risk to areas with known mahinga kai values	Site visit
<u>Rubbish pits</u> :All on-farm rubbish dump discharges are managed to avoid direct discharges of contaminants to groundwater or surface water	
	Site visit

INSTREAM BIODIVERSITY, TERRESTRIAL BIODIVERSITY & BIOSECURITY MANAGEMENT PLAN

To protect and enhance in-stream biodiversity values and maintain any hill country remnant indigenous biodiversity

Target 1: Location of any spring heads, wetlands, and spring-fed streams on the property or within the farming enterprise to recognise their high instream biodiversity values is acknowledged below and located on the FEP map	**Records**
•	FEP Map
Target 2: Prioritise achievement of the targets for Management Area: Waterbody Management for any spring heads, wetlands, and spring-fed streams so as to protect and enhance the instream biodiversity values	**Records**
• Protecting waterbodies has been prioritised through many different methods explained throughout this farm plan.	
Target 3: On farm biosecurity control program is implemented	**Records**
• There is a pest control program to manage plant and animal pests: •	
Target 4: Any development of hill country is permitted as per District Council rules	**Records**
• There is no area of the farm that has not been developed –many areas are now being retired	
Additional Actions needed to meet Targets and Objectives for Biodiversity and Cultural Values Management	**Records**
•	

RIPARIAN PLAN – include here or refer to existing one

CULTURAL VALUES MANAGEMENT PLAN- **not audited 20/21**

MAHINGA KAI

To protect Mahinga kai values

Target 1: Mahinga kai values of surface waterbodies on the property are recognised by achieving other objectives and targets in the Farm Environment Plan, and in addition by:	
1.1 Maintaining existing indigenous vegetation in accordance with relevant regional council and district council vegetation clearance rules or any granted resource consent	
•	
1.2 identifying opportunities to undertake additional plantings of indigenous vegetation, and carrying out and managing any additional plantings in accordance with regional council guidelines for riparian planting;	
• Yes see riparian plan	
1.3 undertaking farming activities in a manner that minimises adverse effects on existing indigenous vegetation and on any additional plantings of indigenous riparian vegetation	
•	
1.4 managing pest plants in accordance with regional council rules	
• Yes see biodiversity section	

TUHITUHI NEHERĀ (ROCK ART SITES)

To protect tuhituhi neherā (Rock Art) sites and the historic, ecological and Ngāi Tahu values associated with these sites and their surroundings

Target 1: irrigation is managed to avoid any adverse effects on tuhituhi neherā (rock art) sites and the historical, ecological and Ngāi Tahu values associated with these sites and their surroundings	
•	
Target 2: Stock are excluded from any tuhituhi neherā (rock art) site so as to avoid damage to the art work, and surrounding area	

•	
Target 3: Manage farming practices to protect tuhituhi neherā (rock art) sites by avoiding adverse effects that may modify, damage, or destroy these sites and the values associated with these sites	
•	
Additional Actions needed to meet Targets and Objectives for Cultural Values Management	**Records**

WATER USE MANAGEMENT (excluding irrigation water) -

To use water efficiently ensuring that actual use of water is monitored and efficient

Target 1 Water Use is efficient for the end use	**Records**
• Water use efficiency is assessed in Effluent management • All stock water is reticulated, and troughs are well maintained • All NOIC water is metered (including stock water)	

GREENHOUSE GAS MANAGEMENT PLAN – not audited 20/21

To understand and reduce GHG emissions from farming practices

Target 1: Understanding GHG emissions	**Records**
○ GHG Overseer number	Overseer
Target 2: Mitigating GHG emissions	**Records**
Sequestering Carbon	
○ Existing vegetation is enhanced and protected ○ Riparian management Plan includes planting sites such as gullies, non-productive land and shelter belts as part of a planting plan ○ Mitigating carbon loss from exposed soil by reducing bare ground and maintaining vegetated cover ○	
Other ways to mitigate GHG emissions	
○ GHG emissions are reduced through consideration of N fertilizer rates and product used	
Additional Actions needed to meet Objectives and Targets in GHG reduction	**Due by**