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Good farming practices for environmental management

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Version 2 - 02/2025 DNZ40 – 040

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Contents

Introduction

Implementing good farming practices on-farm is not only efficient – it helps to minimise business risk and reduce environmental impact. It is 'the right thing to do' and makes business sense.

This guide describes what good environmental management looks like on a dairy farm and focuses on ten key areas for environmental management:

- Nutrients
- Critical Source Areas
- Waterways
- Land and Soil
- Effluent
- Water Use and Irrigation
- Hazardous Substances
- Waste Minimisation
- Biodiversity and Mahinga Kai
- Greenhouse Gases

Each area contains dairy specific Good Farming Practices (GFPs) and detailed explanations of how they can be achieved. It also provides examples of the information that can be used to demonstrate their achievement.

The GFPs are environmental management practices for sustainable dairy farming in New Zealand; and their development has been supported by the dairy companies.

In addition to GFPs, Leading Practices have also been included as suggested future goals for dairy farmers to aim towards.

This Dairy GFP guide is based on the Good Farming Practice Principles initially developed for the Good Farming Practice Action Plan for Water Quality[1]. The Action Plan is a voluntary commitment by the wider primary sector to accelerate the uptake of GFPs for water quality (primarily) and quantity outcomes, to measure and demonstrate this uptake, and to communicate progress.

The Dairy GFPs have been developed to provide a more detailed understanding of what is needed on farm to meet good farming practice on dairy farms. They form the foundation of, and underpin farm environment plans, and provide a framework to support reporting of sector progress.

While the Dairy GFP set minimum criteria for dairy farming, in some areas individual dairy farmers may need to go further. This could be where national regulations, or regional council requirements or consent conditions require farmers to meet additional practice standards, in catchments where there are freshwater and/or ecosystem health challenges.

[1]The Good Farming Practice Action Plan for Water Quality can be found at **dairynz.co.nz/media/5vjnydw4/good_farming_practice_for_water_action_plan_2018_v7.pdf**

How to use this guide?

This guide is divided into 10 key environmental management areas: Nutrients, Critical Source Areas, Waterways, Land and Soil, Effluent, Water Use and Irrigation, Hazardous Substances, Waste Minimisation, Biodiversity and Mahinga Kai, and Greenhouse Gases. An overarching Farm Information, Assessment and Reporting section provides guidance on good data, monitoring and reporting approaches.

Each management area is further divided into practices. For each an explanation of what is required to meet good practice is given, plus links to other relevant information. Leading Practice explanations are also given to highlight ways to go beyond good practice.

Step 1

Practice

For each GFP, identify the practices that are relevant to your farm. For those that are, work out which ones you are already meeting, and which ones you are still working towards.

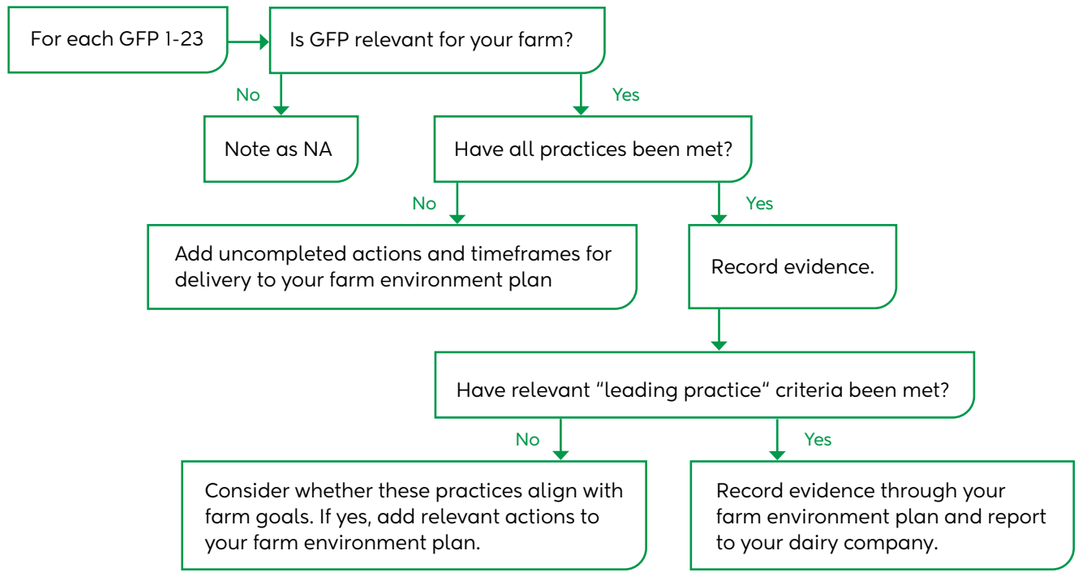
Uncompleted actions and timeframes for completion are added to the farm environment plan.

Step 2

Evidence

For each GFP, if requested, provide evidence for completion of the practice to your dairy company. Examples of types of evidence are given. For actions that have not yet been achieved, capture and prioritise them through your farm environment plan.

Note that dairy companies may use this information to highlight sector progress and scientifically assess the environmental improvements achieved by farmer action. Data will only ever be used in an anonymised way; individual farm actions will not be reported.



Farm Information, Assessment & Reporting

The characteristics of the farm and the farm system are identified[2]

The property and farm enterprise details[3] are recorded, including:	Physical address
	Owner(s), manager and name and contact details of the primary contact person
	Farm name(s), legal description(s) of the land, and any relevant farm identifiers
	Size of the operation (hectares)
	A description of the farming activities
A map(s)[4] or aerial photograph of the farm is produced at a scale that clearly shows:	Boundaries of the property or land areas being farmed
	Boundaries of the main land management units and land uses on the property
	Location of infrastructure including boundary fences, entranceways, tracks, buildings, stockyards, washdown sites, agrichemical and fuel storage sites, offal pits, rubbish dumps, effluent ponds, underpasses, feed-pads, wintering or stand-off pads, housing, silage pits and irrigation
	Location of permanent and intermittently flowing waterways (rivers, streams, lakes, drains, ponds, dams and wetlands)
	Location of riparian vegetation and fences (permanent and temporary) adjacent to waterways
	Locations where stock access or stock crossing of waterways occurs
	Location of any Criticial Source Areas, i.e., features in the landscape where water flows naturally or accumulates, and there is a connection to waterways (gullies, swales)
	Location of any contaminant hotspots, i.e., point sources (stock camps, stream crossings, yards and stock holding areas, stand-off pads and silage pits)
	Location of flood protection or erosion control assets, including flood protection vegetation
	Location of public access routes or access routes used to maintain waterways
	Māori and European archaeological sites
	Location of any significant indigenous areas or Mahinga kai sites
	Resource consents held by the property or farm enterprise

Evidence	Farm description and map

Further Information

Regulatory requirements

Freshwater Farm Plan Regulations; Regional Plan Rules; Consent Conditions

[2]Good Farming Practice (GFP) Principles (2018) alignment: 1.Identify the physical and biophysical characteristics of the farm system, assess the risk factors to water quality associated with the farm system, and manage appropriately

[3]The property and farm enterprise details will be updated once the FW FP regulatory requirements are known

[4]The mapping information requirements will be updated once the FW FP requirements are known

A risk assessment of the farms inherent and management activity risks is undertaken[5]

A risk assessment[6] is undertaken that includes:	Risk Identification – List the relevant rules and regulations that must be met, the farm management activities being undertaken, and the farms inherent risks; from these identify the relevant Dairy GFP for the farm system
	Risk Analysis – Assess each Dairy GFP (including any associated rules and regulations) to determine if it is being achieved
	Risk Treatment – List actions to be taken to achieve each Dairy GFP, and rules and regulations, including: • What actions are already in place • What actions need to be put in place • Timeframes for these actions to occur
Evidence	Risk assessment

Further Information

Regulatory requirements

Freshwater Farm Plan Regulations; Regional Plan Rules; Consent Conditions

[5]Good Farming Practice (GFP) Principles (2018) alignment: 1. Identify the physical and biophysical characteristics of the farm system, assess the risk factors to water quality associated with the farm system, and manage appropriately

[6]The risk assessment process will be updated once the FW-FP regulatory requirements are known

Accurate and auditable records are kept of annual farm inputs, outputs and management practices[7]

Accurate and auditable records are kept that:	Support the farms risk assessment process
	Provide evidence of farm inputs, management practices and outputs that support the actions being undertaken to achieve the Dairy GFP and reduce any additional risks identified through the risk assessment
Leading Practice	Farm management software is used to track and record all farm inputs, outputs, and management activities
Evidence	Records of farm inputs, outputs and management practices

Further Information

Regulatory requirements

Freshwater Farm Plan Regulations; Regional Plan Rules; Consent Conditions

[7]Good Farming Practice (GFP) Principles (2018) alignment: 2. Maintain accurate and auditable records of annual farm inputs, outputs and management practices

Nutrients

Soil phosphorus levels are monitored and maintained below or within the target ranges for the soil-type and crop[8]

Soil Tests	
For each land management unit Olsen-P (or an equivalent recognised soil test) levels are monitored:	Annually for capital applications
	Biennially for maintenance applications

Leading Practice	Olsen-P (or an equivalent recognised phosphate soil test) is monitored at the paddock scale
Evidence	• Olsen-P (or equivalent) soil test monitoring results • Nutrient budget prepared by a suitably qualified person

Further Information

Fertiliser Association
fertiliser.org.nz/Site/resources/booklets.aspx

fertiliser.org.nz/includes/download.ashx?ID=147241

Regulatory requirements

Freshwater Farm Plan Regulations; Freshwater NES (190-N Cap); Regional Plan Rules; Consent Conditions

[8]Good Farming Practice (GFP) Principles (2018) alignment: 4. Monitor soil phosphorus levels and maintain them at or below the agronomic optimum for the farm system

The amount and timing of fertiliser inputs, takes account of all sources of nitrogen and phosphorus, matches plant requirements and minimises losses to waterways and groundwater[9]

Soil Tests	
For each land management unit at a minimum:	Prior to any capital fertiliser applications
	Biennially for maintenance fertiliser applications
	Soil tests, including soil mineral N-testing, are taken for every paddock where long-term pasture is going into forage or other crops
	Soil tests are taken at least 6 weeks prior to the fertiliser application[10]

Nutrient Budget	
A nutrient budget is prepared annually by a suitably qualified person The nutrient budget accounts for:	Different soil types
	Different slope classes
	All sources of nutrient: • Soil nutrient status (including soil pH) • Organic fertilisers including manure and liquid effluent • Imported feed • Previous land use (grazings and crops)
	The nutrient budget is used to set the farms annual fertiliser applications for each land management unit[11]

Fertiliser Application Records	
All fertiliser applications are recorded, including:	Product
	Rate
	Date
	Location

Fertiliser Application
Feed budgets and feed wedges are used in combination with nutrient budgets to match fertiliser applications to crop/pasture demand
Fertiliser is not applied to permanently flowing or intermittent waterways
Fertiliser is not applied to ephemeral watercourses or Critical Source Areas during high-risk periods
Fertiliser is not applied when the soil is saturated, or run-off could occur from sloping land and/or when tile drains are running
Fertiliser is not applied when rainfall is forecast that would result in the soil becoming saturated or there is a risk of run-off from sloping land
Fertiliser is not applied during periods where there is insufficient soil moisture, for the crop or pasture cover to achieve an agronomic response.
Fertiliser applied during the higher risk months of May, June, and July, must be supported by the following evidence: Expected response rate and production that would be achieved from the fertiliser application Record of round length demonstrating adequate time for fertiliser uptake by the crop/ pasture Soil moisture status demonstrating the soil was not saturated or forecast to become saturated Soil temperature status demonstrating that the crop/ pasture was actively growing; at a minimum the soil temperature is >6°C and increasing

[9]Good Farming Practice (GFP) Principles (2018) alignment: 5. Manage the amount and timing of fertiliser inputs, taking account of all sources of nutrients, to match plant requirements and minimise risk of losses

[10]To allow time for laboratory processing of results

[11]Actual fertiliser application may differ from the nutrient budget due to factors such as seasonal climatic variations and feed supply; any changes must be justified and documentedany changes must be justified and documented

Nitrogen Fertiliser Applications

Feed budgets, feed wedges and nitrogen plans are used to minimise the use of synthetic N-fertiliser

Pasture is at least 25mm high (approximately 1,000 kg/DM/ha) before N-fertiliser is applied

The amount of synthetic nitrogen fertiliser applied is less than the Synthetic Nitrogen Fertiliser Cap regulation limits

The soil temperature is assessed prior to applying N-fertiliser to ensure the crop/ pasture is actively growing; at a minimum the soil temperature is >6°C and increasing

For individual N-fertiliser applications to pasture >30 kg/N/ha, the following evidence must be recorded:

- A feed budget demonstrating the feed deficit to be filled
- Expected response rate and production that would be achieved from the N-fertiliser application
- Record of round length demonstrating adequate time for N-fertiliser uptake

Purchased Nitrogen Surplus

The input and output data required to calculate Purchased Nitrogen Surplus[12] is recorded

Purchased Nitrogen Surplus is at or below the target for the farm[13]

[12]Purchased Nitrogen Surplus is the sum of the nitrogen inputs used for production on the farm (e.g., fertiliser, imported feed) minus the total nitrogen that is removed from the farm as products (e.g., meat, milk, crops, exported effluent, supplements sold)

[13]The Purchased Nitrogen Surplus target can be found here **https://indd.adobe.com/view/6dbbb026-d783-4499-9375-8af76561f2a5**

Leading Practice

A nutrient management plan is prepared that describes how N, P, K, S, and any other relevant nutrients will be managed to minimise environmental risk and is revisited when any change in ownership or management occurs.

fertiliser.org.nz/Site/code-of-practice/appendices/appendix_4_nutrient_management_plan_template.aspx

All fertiliser applications are recorded using a geospatial mapping system

Urease inhibitor coated N-fertiliser products are used to minimise the risk of N-losses to the environment

Precision fertiliser application systems and technologies are used, including but not limited to, paddock scale soil testing, precision placement systems, and variable rate applications

Evidence

- Nutrient budget prepared by a suitably qualified person
- Soil test monitoring results
- Fertiliser application records
- Climate data
- SOP's for fertiliser applications

Further Information

Nutrient Management Guide

Fertiliser Association

fertiliser.org.nz/Site/code-of-practice

fertiliser.org.nz/includes/download.ashx?ID=147241

Regulatory requirements

Freshwater Farm Plan Regulations; Freshwater NES (190-N Cap); Regional Plan Rules; Consent Conditions

Fertiliser is stored and loaded to minimise the risk of spillage and losses to waterways and groundwater[14]

Fertiliser storages:
Located at least 50 meters away from permanently flowing or intermittent waterways, ephemeral flow paths, critical source areas, and areas prone to flooding or run-off
Can contain all stored fertiliser, have an impervious floor and are protected from rain
Collect and divert any rain or water away from the storage area
Well ventilated with adequate lighting
Appropriately signed
Able to contain a spillage and provide secondary containment where appropriate

Evidence	Pictures or field observations of fertiliser storage areas

Further Information

Fertiliser Association
fertiliser.org.nz/Site/code-of-practice/best-management-practices-considerations/fertiliser-handling/best_management_practices_fertiliser_handling_stor.aspx

Regulatory requirements

Hazardous Substances and New Organisms Act and Regulations; Agricultural Compounds and Veterinary Medicines Act; Health and Safety at Work Act and Regulations; Regional Plan Rules; Consent Conditions

[14]Good Farming Practice (GFP) Principles (2018) alignment: 6. Store and load fertiliser to minimise risk of spillage, leaching and loss into waterbodies

Fertiliser spreading equipment is maintained and calibrated[15]

Fertiliser spreading equipment is maintained in accordance with the manufacturer's instructions
Fertiliser spreading equipment is calibrated according to the manufacturer's design specifications and the product being spread

Leading Practice	All contractors used for fertiliser spreading are Spreadmark accredited
	fertqual.co.nz/understanding-the-marks/spreadmark
Evidence	Spreading equipment maintenance and calibration records

Further Information

Land wise
fertiliser.org.nz/Site/code-of-practice

Regulatory requirements

[15]Good Farming Practice (GFP) Principles (2018) alignment: 7. Ensure equipment for spreading fertilisers is well maintained and calibrated

Feed is stored, transported and fed to minimise wastage, leachate and soil damage[16]

Storage	
Feed that has the potential to create leachate is stored:	at least 50 metres away from permanently flowing and intermittent waterways
	away from community drinking-water protection zones
	away from ephemeral flow paths or critical source areas
	on hard-sealed or compacted areas
Rainfall run-off is diverted to land away from feed storage areas	

Feeding out
Permanent feed-out areas are sealed, and all run-off is collected and applied to land via the effluent system
Feed-out areas are located away from permanently flowing or intermittent waterways, ephemeral flow paths, and critical source areas
Soil damage from feeding-out is minimised

Leading Practice	Leachate from stored feed is captured and applied to land via the effluent system
Evidence	Pictures or field observations of feed storage areas

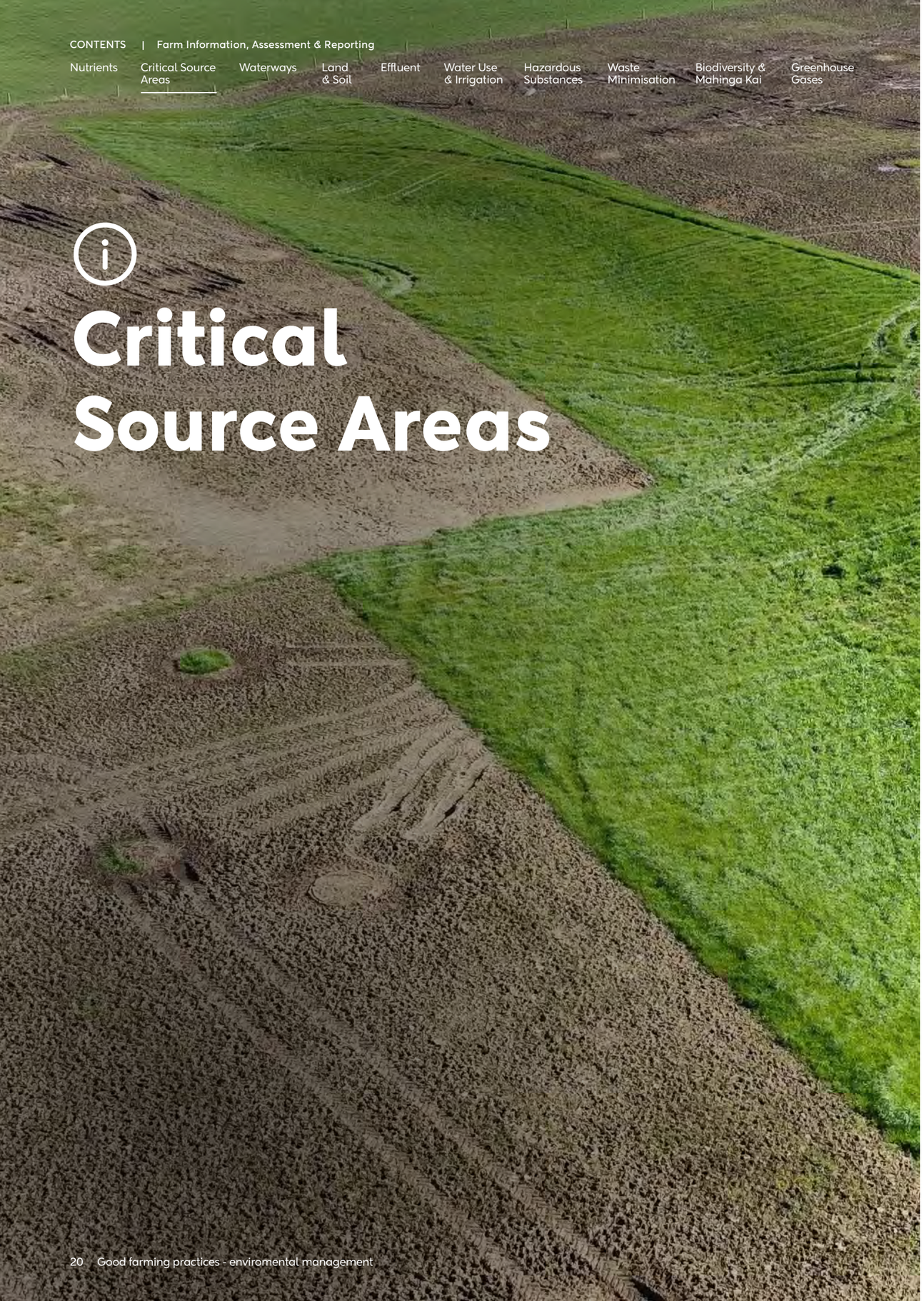
Further Information

Regulatory requirements

Regional Plan Rules

[16]Good Farming Practice (GFP) Principles (2018) alignment: 8. Store, transport and distribute feed to minimise wastage, leachate and soil damage

NOTES



Critical Source Areas

Critical Source Areas and farm Hot Spots are identified and managed to minimise contaminant losses to waterways[17]

Critical Source Areas (CSA) are features in the landscape where water flows or accumulates, and there is a connection to waterways
Contaminant Hotspots are areas where there is potential for point source contamination to waterways

Identification and Management

CSA are identified including the time of year the risk occurs, and actions put in place to reduce or mitigate contaminant loss

CSA are not cultivated during times of high-risk

- when the crop or pasture to be sown would not germinate, i.e., at a minimum the soil temperature is >6oC at 9am and increasing
- when rainfall is forecast that would result in sediment run-off to the waterway

Stock are excluded from CSA during times of high-risk

- when the soil is saturated or when rainfall is forecast that would result in the soil becoming saturated
- when rainfall is forecast that would result in run-off to the waterway

Drainage Systems

Run-off from new sub-surface drainage systems is filtered through a wetland or grass buffers, prior to it entering a permanently flowing or intermittent

Tracks and Gateways

Where possible tracks and gateways are located away from all permanently flowing or intermittent waterways and low points in the landscape

If the track or gateway is beside a permanently flowing or intermittent waterway, the ground is sloped in the opposite direction to avoid run-off

Tracks and gateways minimise water ponding, excessive effluent build-up, and erosion

Run-off from tracks and gateways is filtered by a vegetated strip or sediment traps

[17]Good Farming Practice (GFP) Principles (2018) alignment: 9. Identify risk of overland flow of sediment and faecal bacteria on the property and implement measures to minimise transport of these to waterbodies AND 10. Locate and manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality

Troughs

Troughs are located away from waterways, low points in the landscape or wet areas

The area surrounding troughs is maintained to prevent ponding

Stock Crossings

Stock crossings are present on all permanently flowing or intermittent waterways >1 m that stock cross more than once per month

Stock crossing have raised sides or mounds (bunded) to prevent run-off into waterways

Stock crossings (particularly culverts) allow for fish passage

Temporary Feed-out Areas

Temporary feed-out areas (including in-paddock bale placement) are located away from waterways, low points in the landscape, or where run-off to waterways could occur

Infrastructure Management

The condition of drainage systems, tracks and gateways, troughs, and stock crossings are assessed annually, and maintenance carried out accordingly

Leading Practice	Stock are permanently excluded from all CSA
	Appropriate vegetative buffers are established to filter any run-off to permanently flowing or intermittent waterways
	Run-off from all sub-surface drainage systems is filtered through a wetland or suitable vegetative buffers prior to it entering a permanently flowing or intermittent waterway
	Bunded stock crossings are present on all the farms permanently flowing or intermittent waterways

Evidence	• Pictures or field observations of critical source areas management • Farm management systems

Further Information

Critical Source Areass

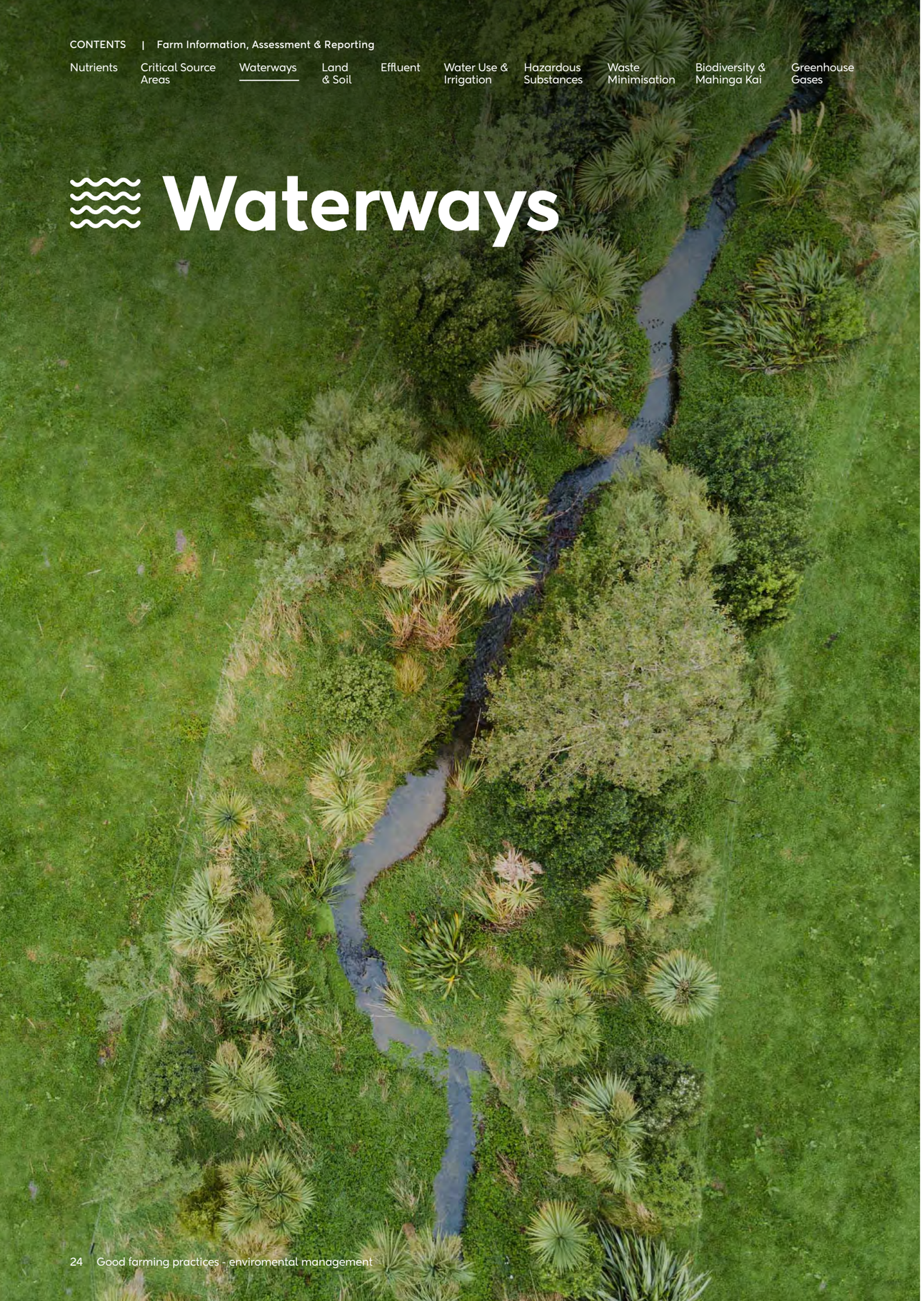
Waikato Regional Council - CSA
waikatoregion.govt.nz/assets/WRC/WRC-2019/6374-HRWO-critical-source-areas.pdf

Efficient Tracks

Stream crossings

Regulatory requirements

Regional Plan Rules



Waterways

Stock are excluded from lakes and waterways[18]

Exclude stock from waterbodies to the extent that is compatible with land form, stock class and stock intensity. Where exclusion is not possible, mitigate impacts on waterways	Stock are excluded from lakes and permanently flowing or intermittent waterways > 1 metre
	The setback from the waterway or lake is a minimum of 3m unless a permanent fence was in place prior to August 2020
	A permanent fence means a 2-wire electric fence, a post and batten fence or a deer fence
	The setback (riparian area) is managed, including the control of plant and animal pests
	Stock are excluded from ephemeral flow paths if grazing occurs while water is flowing
	Wet areas within paddocks are managed to avoid contamination from stock or fertiliser
	Drain cleaning minimises sediment and fish losses
	The length of the farms permanently flowing or intermittent waterways < 1 metre is recorded

Leading Practice	Stock are excluded from permanently flowing or intermittent waterways < 1 metre, ephemeral flow paths, and permanently wet areas
	The livestock exclusion setback is site specific, i.e., is related to the slope run-off potential, and is inclusive of any critical source areas
	A riparian planting plan is in place and being actively implemented

Evidence	• A stock exclusion plan is being actively implemented. • Field observations of stock exclusion, riparian management and drain management • Evidence of the use of temporary fencing such as time stamped photographs • Drain management procedures

Further Information

Waterbodies and wetlands

Drains

Regulatory requirements

Stock Exclusion Regulations; Regional Plan Rules

[18]Good Farming Practice (GFP) Principles (2018) alignment: 10. Exclude stock from waterbodies to the extent that is compatible with land form, stock class and stock intensity. Where exclusion is not possible, mitigate impacts on waterways

Land & Soil

Cultivation is managed to reduce the risk of sediment loss and maintain soil structure[19]

Paddock Selection	
The suitability of each paddock for cultivation is assessed, and high-risk cultivation activities avoided. Considerations include:	Topography and soil type
	Proximity to waterways
	Erosion susceptibility
	Crop sowing and harvest dates
	Cultivation methods
	Previous cropping history

General Management
Crop rotations are planned to enable timely re-sowing and to minimise the time in bare cover during the high-risk winter period
The use of catch/cover crops should be considered to reduce contaminant losses to water and improve soil quality
Permanent vegetation cover is retained in gullies, on steep slopes or beside waterways

Soil Management
Soil structure is assessed every 3-years using Visual Soil Assessment or equivalent method
Compacted soils are alleviated through deep ripping or aeration
Cultivation is avoided when soil moisture is at or beyond field capacity
No or minimum tillage cultivation techniques are predominantly used such as, direct drillling, strip-tillage, or non-inversion tillage.

Evidence	
	• Crop rotation and cultivation plans • Environmental considerations incorporated within the farm businesses crop rotation • Environmental consideration incorporated at an operational level regarding the cultivation, sowing and harvest methods used • Evidence of management actions such as crop or livestock diaries or time stamped photographs

Further Information	Requirements
	Regional Plan Rules

[19]Good Farming Practice (GFP) Principles (2018) alignment: 3. Manage farming operations to minimise direct and indirect losses of sediment and nutrients to water, and maintain or enhance soil structure, where agronomically appropriate AND 12. Manage periods of exposed soil between crops / pasture to reduce risk of erosion, overland flow and leaching

Erosion-prone land is managed or retired to minimise soil losses[20]

All erosion susceptible areas are mapped and have a soil erosion control programme actively being undertaken

Retire all Class 8 and 7e land (when mapped at the farm scale) from grazing

Leading Practice

Develop and implement an erosion control plan for all erosion susceptible areas, including consideration of:

- Indigenous forest
- Exotic forest
- Space planting
- Streambank planting
- Shelterbelts
- Erosion control structures

Evidence

- Erosion susceptibility map
- Pictures and field observations of erosion control actions being implemented

Further Information

Association of Resource Management
nzarm.org.nz/soil-conservation-technical-handbook

Erosion control

Regulatory requirements

Regional Plan Rules

[20]Good Farming Practice (GFP) Principles (2018) alignment: 13. Manage or retire erosion-prone land to minimise soil losses through appropriate measures and practices

Grazing of pastures and crops is managed to minimise sediment and contaminant loss[21]

Grazing Management

A farm grazing policy is developed that considers and manages:

- Erosion susceptibility
- Soil pugging and compaction
- Overgrazing
- Adverse climatic events
- Stock type, class and intensity
- Grazing rounds/rotation lengths

Leading Practice

Feed or stand-off pads are used during periods of wet weather

Evidence

- Grazing policy
- Evidence of management actions such as crop or livestock diaries or time stamped photographs

Further Information

Regulatory requirements

Regional Plan Rules

[21]Good Farming Practice (GFP) Principles (2018) alignment: 15. Manage grazing to minimise losses from critical source areas

Paddocks selected for Intensive Winter Grazing (including intensive baleage wintering) are low risk and managed to minimise the risk of erosion, run-off to waterways and leaching to groundwater[22]

Paddock Selection	
Undertake a risk assessment and select low risk paddocks that:	Are away from waterways
	Livestock must be kept at least 5m away from the bed of any river, lake, wetland or drain, regardless of whether there is any water in it at the time
	Are 10° or less maximum slope
	Determined by measuring the slope over any 20m distance
	Are not vulnerable to pugging
	Are not susceptible to erosion
	If low risk paddocks are not available adapt the farming system to avoid intensive winter grazing

Waterways	
When selecting areas for intensive winter grazing the following land areas are not cultivated (and vegetation cover is maintained) between 1 May to 30 September:	Ephemeral flow paths or natural drainage channels that run during times of high rainfall
	Critical source areas such as gullies or swales
When intensive winter grazing occurs between 1 May and 30 September permanent or temporary fencing that excludes stock from grazing, is placed around:	Ephemeral flow paths or natural drainage channels that run during times of high rainfall
	Critical source areas such as gullies or swales

Supplementary Feed
Where supplementary feed such as baleage is used, it is strategically placed in the crop prior to the start of winter
Supplementary feeding areas (temporary feed-out area) are located away from permanently flowing or intermittent waterways, ephemeral flow paths, and critical source areas
Supplementary feed is used tactically, for example offer more feed during cold conditions when demand increases and crop utilisation declines

Grazing Management
Take all reasonably practicable steps to minimise pugging
Breaks are actively managed as appropriate for the winter grazing management system
Grazing occurs towards the waterway
Land that has already been grazed is back-fenced; this does not prevent its use to help manage through adverse weather events
Portable water troughs are used for stock drinking water and placed away from ephemeral flow paths and critical source areas, close to the feed face and moved as appropriate for the winter grazing management system

[22]Good Farming Practice (GFP) Principles (2018) alignment: 14. Select appropriate paddocks for intensive grazing, recognising and mitigating possible nutrient and sediment loss from critical source areas AND 15. Manage grazing to minimise losses from critical source areas

Vegetation Re-establishment

Resow land as soon as practicable after grazing

Adverse Events

An adverse event management plan is in place that considers animal welfare implications alongside environmental risk management including minimising the risk from pugging

Leading Practice	Stand-off pads or paddocks are used during periods of very wet weather
	Sediment traps or actively managed constructed wetlands are used minimise sediment loss

Evidence

- Resource consent
- Winter grazing plan including:
  - Mitigations required for each paddock
  - Grazing management procedures
  - Managing grazing through extreme rainfall events
- Evidence of farm specific operating procedures and their implementation
- Evidence of farm specific adverse event plans
- Pictures and field observations of grazing and cropping management actions such as time stamped photographs

Further Information

Wintering on crops

Improving your wintering systems

Regulatory requirements

Freshwater NES

Regional Plan Rules

Consent Conditions

NOTES

Effluent

Effluent and manure is applied at depths, rates and amounts that match plant requirements and minimise the loss of nutrients or microbial pathogens to waterways and groundwater[23]

Effluent Management Plan	
An effluent management plan is in place that includes:	Regional rules and consent conditions
	A farm effluent map that highlights: • Waterways • Buffer and exclusion zones • High and low risk soils • Effluent system layout (hydrants and runs)
	System maintenance checks
	System operating procedures
	Health and safety
	Emergency procedures and contacts

Nutrients
Soil tests are taken biennially in the effluent application area, and fertiliser applications adjusted accordingly
The nutrient loading rules or consent conditions are not exceeded

[23]Good Farming Practice (GFP) Principles (2018) alignment: 19. Apply effluent to pasture and crops at depths, rates and times to match plant requirements and minimise risk to waterbodies

Application

All effluent applications are recorded including:	Date
	Location
	Depth applied
Effluent is not applied when soils are at or above field capacity	
Effluent is not applied when rainfall that would result in the soil becoming saturated is forecast	
The application meets the Distribution Uniformity upper quartile (DU_{uq}) standard of <1.25	
Average application rates do not exceed the soils infiltration rate	
The odour impact upon neighbouring properties is considered, including any consent conditions	
Failsafe mechanisms are in place:	Low pressure pump cut-off, or
	Irrigator movement pump cut-off, and
	Pond level sensor

Effluent and Manure Storage

The effluent storage level is actively managed to remain as low as possible for the prevailing climatic conditions
Manure levels are actively managed to remain within the storage bunker

Training

Staff are trained in the effluent systems operation and maintenance

Leading Practice	Effluent area soil moisture is monitored using a soil moisture sensor or soil water budget
	An effluent operation and maintenance manual is in place and actively used
	Telemetered proof of placement of effluent applications
	Changes in the nutrient composition of the effluent or manure applied are understood across the milking season, by testing effluent samples throughout the season; fertiliser applications to the effluent area are adjusted according to nutrient composition
	Soil tests are taken annually in the effluent application area

Evidence

- Annual soil tests
- Nutrient budget
- Soil moisture monitoring for effluent application decision-making
- Rainfall records
- Effluent and manure application records including amount, depth, date, and location
- Evidence of staff training programme

Further Information

Effluent management Plan Poster

Effluent

Regulatory requirements

Regional Plan Rules

Consent Conditions

The effluent system is designed, operated and regularly checked to minimise the risk of nutrient and microbial pathogen loss to waterways and groundwater, and to prevent microbial contamination[24]

New effluent systems include all new developments, and existing system expansions or redevelopments	
Effluent is collected from all sources:	Dairy sheds
	Yards
	Barns, feed-pads, and stand-off pads
	Underpasses
	Feed storage areas (if applicable)

Storage	
The effluent storage volume is sized to meet either the:	Consent conditions; or
	Plan requirements; or
	The 90th percentile storage volume as calculated by the Dairy Effluent Storage Calculator (DESC)
The storage meets local Building Act requirements	
The storage is sealed to prevent leakage to groundwater	

[24]Good Farming Practice (GFP) Principles (2018) alignment: 16. Ensure the effluent system meets industry-specific Code of Practice or equivalent standard AND 17. Have sufficient suitable storage available for farm effluent and wastewater AND 18. Ensure equipment for spreading effluent and other organic manures is well maintained and calibrated

Assessment	
Effluent system checks are undertaken at least annually, including testing of effluent depth and rate	
Maintenance is undertaken as and when required to ensure there is no decline in effluent system performance	
Leading Practice	The volume of farm effluent storage meets the 90th percentile volume as calculated by the Dairy Effluent Storage Calculator (DESC)
	The design of the farm effluent storage is consistent with IPENZ Practice Note 21: Farm Dairy Effluent Ponds
	An effluent Warrant of Fitness (WOF) is undertaken every 3-years or when there is a major change to the infrastructure
Evidence	• Evidence provided that the effluent designer is design certified and/or the Effluent Design company is accredited. • Effluent WOF or commissioning test report/re-test report. • DESC report • Storage drop test report • Evidence provided of checks and maintenance *Note: The industry checklist provides a minimum standard for this.*

Further Information

Irrigation NZ
irrigationnz.co.nz/PracticalResources/SpecialistEquipment/Fertigation

FDE designs standards and code of practice 2015

Effluent Systems

Regulatory requirements

Regional Plan Rules

Consent Conditions

Water Use & Irrigation

Dairy shed and stock water use is efficient and prevents source contamination[25]

National regulations, permitted activity or resource consent conditions are met
All well heads are sealed, and stock permanently excluded from them
A backflow prevention system is installed (where required)
Water takes are monitored (stock and dairy shed) and leaks identified and repaired as required
Dairy shed water use is efficient, i.e., water use is appropriate for the washdown system

Leading Practice	All water takes are telemetered
Evidence	• Reports, pictures, or field observations of well heads and backflow prevention systems • Water monitoring records and farm water supply maintenance logs

Further Information

Bore responsibility - Hawkes Bay Regional Council
hbrc.govt.nz/services/water-management/bore-security

Irrigation NZ
irrigationnz.co.nz/PracticalResources/COP/Fertigation

Water use on farm

Regulatory requirements

Water Measurement and Reporting Regulations 2020

Regional Plan Rules

Consent Conditions

[25]Good Farming Practice (GFP) Principles (2018) alignment: New, not in the 2018 GFP Principles

The depth, rate and timing of irrigation is managed to meet plant demand and minimise the risk of leaching and run-off

Scheduling	
Irrigation decision-making is informed by a soil water budget or soil moisture sensor	
For both methods, the soils full-point and irrigation trigger point are correctly set and monitored	
Irrigation decision-making also includes monitoring of:	Depth of irrigation applied
	Rainfall
	Weather forecasts

Training
Staff are trained in irrigation system operation and maintenance

Leading Practice
Irrigation management zones are set based on irrigation system operation, soil type and crop type
Irrigation decision-making is informed by a soil water budget or soil moisture sensor for every irrigation management zone
An irrigation operation and maintenance manual is in place and used to train staff

Evidence
• Sensor trace or data • Water budget model or calculation • Evidence of staff training or certificate of attendance for an irrigation workshop

Further Information

Irrigation NZ - Scheduling
irrigationnz.co.nz/PracticalResources/GMP/Scheduling

Regulatory requirements

Regional Plan Rules

Consent Conditions

The irrigation system is designed, operated and regularly checked to minimise the amount of water applied to meet plant demand, and prevent microbial contamination[26]

Design & Installation
National regulations, permitted activity or resource consent conditions are met
All well heads are sealed, and stock permanently excluded from them
A backflow prevention system is installed (where required)
All irrigation water takes are telemetered
All new irrigation systems are designed and installed in accordance with industry codes of practice and standards
New water and irrigation systems include all new developments, and existing system expansions or redevelopments.
An Irrigation Design accredited company and/or a certified irrigation designer is used.
A 'wet' commissioning test is undertaken that includes pressure, flow, depth, and uniformity
The design meets a low quartile distribution uniformity (DU_{lq}) of >0.80.

Assessment	
Pre-season checks, including a visual inspection of the irrigator when it is running, are undertaken for each irrigation system annually	
A performance assessment is undertaken for each irrigation system every 5-years or:	when a major system change occurs
	there is significant non-compliance

Further Information

Bore Security – Hawkes Bay Regional council
hbrc.govt.nz/services/water-management/bore-security

MfE - measuring and reporting water intakes
environment.govt.nz/publications/measuring-and-reporting-water-takes-brochure

Irrigation NZ
irrigationnz.co.nz/practicalresources/irrigationdevelopment/startup
irrigationnz.co.nz/practicalresources/irrigationdevelopment/commissioning
irrigationnz.co.nz/practicalresources/cop/fertigation
irrigationnz.co.nz/practicalresources/cop/design
irrigationnz.co.nz/practicalresources/cop/performanceassessment

Regulatory requirements

Water Measurement and Reporting Regulations 2020

Regional Plan Rules

[26]Good Farming Practice (GFP) Principles (2018) alignment: 21. Design, check and operate irrigation systems to minimise the amount of water needed to meet production objectives

Hazardous Substances

Hazardous substances (agrichemicals and fuel) are stored, handled, used and disposed of to avoid contamination of waterways and groundwater[27]

An inventory of all hazardous substances stored on-farm is kept, including Safety Data Sheets (SDS)
All environmental risks are identified, and staff made aware of these and how they are to be managed
Hazardous substance information and training is provided
A Certified Handler certificate is held if class 6.1A or 6.1 B are stored or used on site by farm staff
Procedures are in place for managing emergencies

Storage	
Agrichemicals and fuels are stored separately	
Storages are:	Located away from waterways or areas prone to flooding
	Appropriately signed
	Able to contain a spillage and provide secondary containment where appropriate

Application
Applications follow the SDS conditions
Application equipment is calibrated at least annually
Before spraying sensitive areas are identified including waterways, or significant indigenous vegetation and/or species
When spraying monitor wind speed and direction to avoid spray drift into waterways or significant indigenous vegetation and/or species

[27]Good Farming Practice (GFP) Principles (2018) alignment: New, not in the 2018 GFP Principles

Leading Practice	Storage
	All fertiliser and fuel storages are covered
	All agrichemical and fuel storages provide secondary containment
	Application
	Farm applicators hold the GROWSAFE standard (or equivalent) certificate
	Agrichemical contractors hold a GROWSAFE Registered Chemical Applicator (or equivalent) certificate

Evidence

- Pictures or field observations of storage areas
- SOPs for hazardous substance handling including emergency procedures
- Inventory of hazardous substances on site and associated SDS.
- Emergency response kit including spill kit; fire extinguisher; emergency response card; first aid kit
- Appropriate signage (as per SDS requirements)
- Well-maintained PPE (as per SDS requirements)
- Spray records and climate data

Further Information

NZS 8409:2021 (Growsafe)
growsafe.co.nz/StandardManual/Introduction.aspx

Worksafe
worksafe.govt.nz/topic-and-industry/agriculture/chemicals-and-fuels-on-farms

Regulatory requirements

Hazardous Substances and New Organisms Act and Regulations

Agricultural Compounds and Veterinary Medicines Act

Health and Safety at Work Act and Regulations

Regional Plan Rules

NOTES

Waste Minimisation

Farm waste is minimised[28]

	A waste minimisation system is in place which prioritises waste reduction, and where this is not possible focuses on reuse and recycling
	Where available, recycling schemes are used for farm waste, e.g., scrap metal, baleage wrap, agrichemical containers, tyres, paint, oil, batteries, and other hazardous substances
	Farm dumps and offal pits are located at least 50m away from waterways and above the water table
	Hazardous substances are not disposed of in the farm dump
	There is no burning of farm dump contents
Leading Practice	All farm waste is sent off farm for disposal in a registered waste facility
Evidence	• Waste reduction plan • Evidence of recycling (receipts/ bins) • Evidence of reuse (timestamped photos)

Further Information

Waste management

Regulatory requirements

Regional Plan Rules

[28]Good Farming Practice (GFP) Principles (2018) alignment: New, not in the 2018 GFP Principles

Biodiversity & Mahinga kai

Farm indigenous biodiversity and Mahinga Kai values are identified and protected[29]

Indigenous biodiversity and Mahinga kai values are protected:	Existing areas are mapped
	Existing areas are managed to maintain their current integrity and values
	Existing access arrangements to Mahinga kai sites are maintained

Leading Practice	Indigenous biodiversity and Mahinga Kai values are actively restored and enhanced including:
	Stock exclusion
	Planting or regeneration of existing areas
	Plant and animal pest control
	Identifiation of less productive land for restoration projects
	New plantings
	Engagment with local hapu/iwi to improve access to Mahinga kai sites

Evidence	• Farm indigenous biodiversity and Mahinga Kai map • Evidence of plant and animal pest management

Further Information

Biodiversity

Regulatory requirements

[29]Good Farming Practice (GFP) Principles (2018) alignment: New, not in the 2018 GFP Principles

Greenhouse Gases

Farm greenhouse gas emissions are known and a plan is in place to reduce or off-set them, that also considers adaptation to climate change[30]

Agricultural greenhouse gas emissions are known by gas, including:	Methane from: • Livestock • Effluent Nitrous oxide from: • Livestock • Fertiliser
A plan is in place to minimise or off-set emissions over time, including:	Improving the efficiency of pasture and crop production Reducing the total amount of feed eaten Matching feed demand with pasture growth and utilisation Improving the management of livestock effluent

Leading Practice	**Total greenhouse gas emissions are known by gas, to also include:**	
	Carbon Dioxide	• Fossil fuels
		• Energy use
		• Sequestration
	The plan to minimise or off-set emissions over time, also considers:	
	Adoption of energy efficient vehicles, machinery, technology, and practices	
	Generation of renewable energy	
	Future climate risks and opportunities are known:	
	Temperature and rainfall changes	
	Extreme events	
	Options to increase farm resilience are assessed and implemented	

[30]Good Farming Practice (GFP) Principles (2018) alignment: New Greenhouse gases: Farm Planning Guidance

Evidence	• Farm greenhouse gas numbers can be provided • Evidence of a plan to reduce or off-set emissions • Region-specific climate change challenges and opportunities can be relayed

Glossary of terms

Agronomic response	Means beneficial crop or pasture growth is observed from the farm management activity
Artificial waterway	Means a waterway that is man-made including a stock water or irrigation race and a farm drain (an artificial channel designed to lower the water table and/ or reduce surface flood risk). They do not include a modified waterway (where the flow path of a permanent or intermittent waterway has been altered)
Auditable records	Means the data, information and documents kept to provide an auditor with evidence that an activity has been undertaken
Backflow prevention system	Means a system that protects a ground or surface water supply from potential contamination. It may include a physical air gap or a specific device such as a reduced pressure zone or double-check valve
Capital fertiliser application	Means an application of nutrients that aims to raise soil nutrient status beyond maintenance requirements as measured by soil testing
Catch or Cover crops	Means a fast-growing crop that is grown between the main crop to take up excess soil nitrogen and provide vegetative cover to reduce the risk of nitrogen leaching and/or sediment run-off
Compaction (soil)	Means the damage caused to soil quality by machinery movements or livestock treading
Contaminant hotspots	Means the areas of the farm where there is a high-risk of contaminants being lost to the environment
Critical Source Areas	Means the same as defined in the National Environmental Standard for Freshwater (NES-F): A landscape feature such as a gully, swale, or depression where run-off accumulates from adjacent land and delivers or has the potential to deliver contaminants to waterways, lakes and wetlands or their beds
Crop rotation	Means the practice of growing crops in succession on the same land
Cultivation	Means any process that involves turning over or tilling the soil, it includes pasture renewal and cropping
Dairy Good Farming Practices (GFP)	Means the farming activities that can be reasonably expected of a dairy farmer to help meet environmental objectives
Ephemeral flow paths	Means a waterway that temporarily conveys water immediately following a rain event

Erosion susceptible areas	Means the areas on farm that are eroding or have the potential to erode, including (but not limited to) surface, gully, slip and streambank erosion.
Failsafe mechanism (effluent)	Means a monitoring device or control system that minimises the risks from a breakdown or poor management of the effluent system
Farm	Means the dairy milking platform, unless otherwise stated in the Dairy GFP document
Farm dump	Means a location on-farm used to dispose of general farm waste
Feed budget	Means a predictive analysis of the seasonal pasture supply in relation to livestock demand, including an estimate of any deficit or surplus
Feed storage area	Means an area where supplementary feed is stored on-farm, including pits, bunkers, and sheds
Feed wedge	Means a paddock-scale feed analysis at any given point in time. Measured pasture covers of each paddock are arranged in order of longest to shortest, and a line placed over these starting at the target pre grazing cover and fishing at post grazing cover. From this it can be determined whether the farm has a surplus of deficit of feed.
Grazing round/ rotation	Means the length of time before livestock return to graze the same paddock
Imported feed	Means feed that is bought on to the farm
Inherent risks	Means the risks posed to the environment from the biophysical characteristics of the land
Intensive winter grazing	Means the same as the NES-F interpretation: **The grazing of livestock on an annual forage crop at any time in the period that begins on 1 May and ends on the 30 September of the same year**
Intermittent waterway	Means a waterway that only flows at certain times of the year, but does not include an artificial waterway unless they convey stormwater to an intermittent waterway
Land management unit	Means a homogenous block of land that responds in a similar way under similar management
Leading Practices	Means the on-farm activities that dairy farmers could undertake to go beyond Good Management Practices
Maintenance fertiliser application	Means an application of nutrients that aims to maintain the balance between nutrient inputs and outputs as measured by the soil nutrient status from a soil test

Minimum tillage	Means the process of establishing pasture or a crop using the minimum amount of soil disturbance
New effluent system	Means a new or upgraded effluent system installed on or after 1 January 2023
New irrigation system	Means a new or upgraded irrigation system installed on or after 1 January 2023
Nutrient Budget	Means a modelled calculation of the farm's annual nutrient flows (inputs and outputs)
Offal pit	Means a covered hole excavated on-farm for the purpose of disposing of offal and dead livestock
Overgrazing	Means the grazing of pasture to the point where cover is depleted leaving bare unprotected patches of soil
Permanent feed-out area	Means a purpose-built area with an impervious surface that is regularly used for supplementary feeding or loafing of dairy cattle, i.e., feed pad, winter pad, standoff pad, or loafing pad, but not a sacrifice paddock
Permanent vegetation	Means an area where the vegetative ground cover is maintained
Permanent waterway	Means a waterway that flows year-round, but does not include artificial waterways unless they convey stormwater to a permanent waterway
Pugging (soil)	Means the damage caused to soil structure by stock trampling of saturated soils
Purchased N-surplus	Means the sum of the nitrogen inputs used for production on the farm (fertiliser (including fertigation) and imported feed minus the total nitrogen that is removed from the farm as products (meat, milk, crops, exported effluent, supplements sold)
Response rate	Means the amount of pasture or crop grown (kg/DM) in relation to the amount of nutrient applied (kg/ha)
Soil erosion control programme	Means a plan of works and farm practices to manage the erosion susceptible areas on farm
Soil temperature	Means the temperature of the soil at 9am each day
Stock composting area	Means a location on-farm used to dispose of dead livestock through the process of composting
Stock crossing	Means infrastructure that is used for stock to cross over a river or stream to prevent damage to the bed and avoid contaminants directly entering the waterway, they include bridges and culverts

Sub-surface drainage	Means the process of removing excess water from the soil and includes mole drains, tile drains and slotted pipes
Supplementary feed	Means the additional homegrown or bought in feed used to fill feed deficits
Synthetic N-fertiliser	Means inorganic chemically manufactured nitrogenous fertilisers
Temporary feed-out area	Means temporary areas of pasture where supplementary feed is fed to cattle
Well head	Means the component of a groundwater bore used for water abstraction that is above the surface
Wet areas	Means areas of pasture where the soil is predominantly saturated year-round


DairyNZ