



SUSTAINABLE DAIRYING –

WATER ACCORD

A commitment to New Zealand
by the dairy sector

FOUR YEARS ON...

PROGRESS REPORT FOR THE 2016/17 SEASON



Sustainable Dairying: Water Accord

The Sustainable Dairying: Water Accord (the Accord) has been developed under the oversight of the Dairy Environment Leadership Group (DELG). DELG includes representatives from the dairy farming community, including farmers, dairy processing companies, central government, regional councils, and the Federation of Maori Authorities.

Accountable Partners

The following Accord partner organisations have specific responsibilities for ensuring that the dairy sector delivers on its Accord commitments, and that robust monitoring and reporting systems are in place to measure our performance. These partners undertake to discharge their responsibilities in good faith and to the best of their abilities.



Jim van der Poel
Chairman



Dairy for life

John Monaghan
Chairman



Laurie Margrain
Chairman



Kingi Smiler
Chairman



Graeme Milne
Chairman



Stephen Allen
Chairman



Malcolm Bailey
Chairman



Richard Hickson
General Manager

Supporting Partners

The successful delivery of the Accord is also reliant on the generous support of the following partner organisations:



Friends of the Accord

The Accord process enjoys the support of a wide group of friends who share the Accord's strategic objectives and work collaboratively with accountable and supporting partners to continually improve the dairy sector's environmental footprint. The friends of the Accord are:

- Westland Milk Products
- Regional/Unitary Councils: Northland Regional Council; Auckland Council; Waikato Regional Council; Bay of Plenty Regional Council; Hawke's Bay Regional Council; Gisborne District Council; Taranaki Regional Council; Horizons Regional Council; Greater Wellington Regional Council; Environment Canterbury; West Coast Regional Council; Marlborough District Council; Tasman District Council; Otago Regional Council; Environment Southland
- The Federation of Māori Authorities
- Ministry for Primary Industries
- Ministry for the Environment

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The Dairy Companies Association of New Zealand (DCANZ) is the umbrella body of companies processing milk in New Zealand go to www.dcanz.com for more information.

DairyNZ is the industry organisation representing New Zealand's dairy farmers, funded by farmers through a levy on milksolids. More information is available at www.dairynz.co.nz.



Welcome

This is the fourth annual progress report for
the Sustainable Dairying: Water Accord

Water Accord Foreword

A sustainable dairy sector is good for our economy, creating employment, exports and a farming lifestyle. Farmers understand that our sector's sustainability is dependent on our ability to manage resources respectfully and responsibly.

We know New Zealanders want and expect us to care for our waterways. When the Sustainable Dairying: Water Accord, was launched in 2013, New Zealand's dairy farmers committed to improving waterway quality by reducing their environmental impact. The Water Accord, a voluntary initiative involving approximately 11,500 dairy farms, is a set of national good practices to lift environmental performance.

This is the fourth annual progress report for the pan-sector Sustainable Dairying Water Accord, for the year 2016/17. It shows genuine progress with our commitments. Five of the Accord targets have been achieved and substantial progress has been made with another three. Each step forward represents a significant effort and investment by farmers and dairy companies.

Over the past four years, dairy farmers have completed fencing of 97.5 percent of waterways on their properties to prevent dairy cattle from entering waterways. Bridges and culverts on 99.7 percent of stock crossing points also exclude cows from rivers and streams. Behind these statistics are thousands of individual farmers, budgeting for fence posts and wire, often in tight years with low milk prices, putting in the man hours and keeping up the maintenance.

Like maintaining waterway fencing, our work towards achieving good farming practice is never completed. Research, often funded by farmers, is enabling us maintain momentum.

In November 2017, we launched the Dairy Tomorrow strategy that sets out our commitments and goals for the coming years. The strategy champions the implementation of Good Farm Practices which bring together the best sustainable farming methods.

How we measure future significant on-farm environmental improvements, taking learnings from the Water Accord, is an important focus of Dairy Tomorrow. Our sector is exploring a new measurement and reporting framework that is strongly aligned with the international Dairy Sustainability Framework (DSF).

We look forward to sharing this with you in the future.



Jim van der Poel
Chairman
DairyNZ



Malcolm Bailey
Chairman
Dairy processing companies
association of New Zealand

dairy tomorrow

The future of New Zealand dairying.

Our commitments and goals set out our aspirations for what we want to achieve as a sector in order to be trusted and valued, productive and competitive. This will be done through working collaboratively with others over the next decade and more.

COMMITMENTS

Over the next decade and beyond, we will work collaboratively with others to achieve the following commitments and goals.

- 1 We will protect and nurture the environment for future generations
- 2 We will build the world's most competitive and resilient dairy farming businesses
- 3 We will produce the highest quality and most valued dairy nutrition
- 4 We will be world leading in on-farm animal care
- 5 We will build great workplaces for New Zealand's most talented workforce
- 6 We will help grow vibrant and prosperous communities

Overview of the Accord process

Launched in 2013, the Sustainable Dairying: Water Accord outlines a set of national good management practice benchmarks to lift the environmental performance of New Zealand's dairy farms.

This report is the fourth annual progress report which sets out our sector's environmental management achievements in the period 1 June 2016 to 31 May 2017.

The Accord involves an extensive range of dairy industry participants including DairyNZ, DCANZ (Dairy Companies Association of New Zealand), dairy processing companies who account for most of the milk collected for processing in New Zealand and supporting partners. The Accord aims to deliver sustainable improvements to New Zealand's water quality outcomes by enhancing dairy farm performance through the promotion of good management practices. This is supported by an unwavering commitment to measuring and reporting on dairy sector progress in a robust and transparent way.

The current version of the full Sustainable Dairying: Water Accord is available at www.dairynz.co.nz/wateraccord.

Scope of this progress report

Approximately 11,400 dairy farms are covered by the Accord process which sets out a number of commitments and targets in the following areas:

- Riparian management
- Nutrient management
- Effluent management
- Water use management
- Dairy farm conversions

Dairy farms supplying Fonterra, Miraka, Open Country Dairy, Synlait, Tatua, and Oceania Dairy fall within the scope of the Accord. Farms supplying other dairy processing companies are not included in the Accord's measurement, reporting and audit system.

Developing the Progress Report

Each year, the Accord's accountable and supporting partners submit comprehensive data outlining their performance against the commitments and targets outlined above. This data is consolidated by DairyNZ prior to undergoing an independent audit by TELARC Limited. The data collation and consolidation processes are undertaken in accordance with the following Audit Standards:

- Sustainable Dairying: Water Accord Audit Standard (DairyNZ Requirements) Version 7, December 2017
- Sustainable Dairying: Water Accord Audit Standard (Dairy Company Requirements) Version 9, 2017

The Auditor's Statement, which appears at the end of this report, provides a detailed overview of how the independent audit was conducted. The full auditor's report is made available once the audit is complete and available at www.dairynz.co.nz.

Previous audit recommendations

The audit report for the 2015/16 season made three recommendations to the Dairy Environment Leaders' Group (DELG), which is the governance group responsible for the Accord process to consider. In summary those recommendations related to:

- examining whether industry resourcing of its riparian management plan commitments was sufficient to meet the 2020 target for 100% of dairy farms to have these plans in place
- assessing the continued relevance and robustness of the definition and interpretation of several Accord requirements in the context of the first major Accord review due to be completed by 31 December 2017
- developing approaches to both account for and quantify uncertainties in the reported data. This recommendation reflects the challenges associated with measuring progress in a complex and dynamic farm system environment.

Riparian management plans

DELG has carefully considered these recommendations. In relation to riparian management plans, the key issue in meeting the target was not a lack of resourcing but instead the Accord's reporting structure, which does not make provision for riparian planning to be integrated into the comprehensive Farm Environment Plans that are being increasingly used by milk processing companies. This level of integration is a positive step forward because Farm Environment Plans (FEPs) help farmers to identify, assess and prioritise the environmental risks in their farm systems, and develop tailored mitigations aligned with their business needs. Several regional councils have also introduced mandatory Farm Environment Plan requirements to help improve water quality outcomes at the catchment scale, a trend that is likely to continue in future. The Dairy Tomorrow strategy also commits the dairy sector to ensuring all farms implement and report under certified farm sustainability plans by 2025. These developments raise important questions about the value of retaining our riparian plan commitments in their current form.

Accord review process

The Accord review process coincided with the development of the Dairy Tomorrow Strategy. Consequently, DELG resolved to conduct the Accord review process in two phases, with the first phase examining opportunities to improve the clarity of several technical definitions and opportunities to identify and manage data uncertainty more effectively. The second phase would explore the future direction of the Accord process.

Technical definitions

The key item of business during the technical review phase was to consider whether the current 'dairy farm' definition should be extended to include support blocks from 1 June 2017 as originally envisaged by the Accord's founding document.

Feedback from Accord partners provided strong evidence that this proposed change was not feasible due to the complex legal ownership structures of support blocks and the fact that most farmers renegotiate access rights, often on an annual basis. Therefore, DELG agreed to postpone any changes to the 'dairy farm' definition until 1 June 2019, pending further consultation with Accord partners and the outcome of the second phase of the review process, which examines the current state and future direction of the Accord.

Managing data uncertainty

DELG also agreed with the recommendation in last year's audit report regarding the need to develop new approaches to account for and quantify uncertainties in the reported data. DELG recognises that identifying and communicating uncertainty is a key consideration when undertaking environmental performance assessments such as the Accord audit.

During the review process, DELG identified several different types of uncertainty. The most common one related to the use of subjective terminology which created some uncertainty regarding the precise nature of the obligations that Accord partners were being asked to report against. DELG is addressing this in the short-term by providing more explicit guidance to partners on the Accord's strategic intent and the associated performance expectations. DELG has also ensured that the following sections of this Report provide full disclosure regarding the areas where data uncertainty issues have been particularly challenging during the audit of the current season. Although environmental systems are inherently complex and data uncertainties will continue to be unavoidable to some extent, DELG recognises the importance of applying robust design principles when designing future audit processes.



Future direction of the Accord process

The second phase of the review process is ongoing at the date of this report. To date, this phase of the review process has validated the invaluable role the Accord process has played in introducing a system that links on-farm system performance to environmental outcomes. The Accord was one of the first such environmental management initiatives launched in New Zealand and provided a strong platform for the dairy sector to start a national, evidence-based conversation about the extensive programme of work underway on-farm and across the processing sector to improve water quality outcomes for the benefit of all New Zealanders.

The current Accord structure has served the sector well and will continue doing so into the future. However, the key lessons learnt from the last four years of the audit programme need to be distilled and applied.

Those lessons relate to the challenges associated with:

- accurately measuring performance in a dynamic, bio-physical environment
- devising performance targets and metrics that incentivise innovation and enable farmers and dairy processing companies to communicate a much richer story about the pace of environmental management transformation within the sector
- developing and maintaining a performance measurement and reporting system with the flexibility to adapt to changing strategic priorities, national policy standards and regulatory requirements.

Dairy Tomorrow

The new Dairy Tomorrow Strategy also provides an exciting opportunity to explore how the Accord process can contribute to the goal of protecting and enhancing the environment for future generations. With this in mind, the sector is actively exploring a new measurement and reporting framework that is strongly aligned with the international Dairy Sustainability Framework (DSF).

The DSF is underpinned by 11 sustainability criteria, including six environmental performance criteria in: greenhouse gas emissions, soil nutrients, waste, water (availability and quantity), soil and biodiversity. Alignment with the DSF provides a compelling opportunity to measure and report on the dairy sector's environmental performance in an integrated way, and forge stronger connections across the primary industries through a shared goal of continually improving environmental stewardship standards.

Accord partners are excited about charting a new path for the Water Accord. Work on the transition process has already begun in earnest so that the new measurement and reporting framework is ready in time for the 2019/2020 season. This means the upcoming Year 5 audit of the 2017/18 season results will be the final one under the current framework.

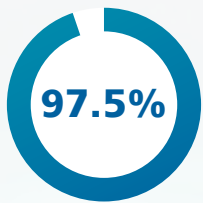


Summary and highlights



What we've achieved so far...

Riparian management



97.5%
of waterways
have dairy
cattle
excluded.

(24,744km of Accord
waterways).



13
step-by-step
riparian
guides

have been produced by DairyNZ, in
partnership with regional councils,
to assist with practical advice.



99.7%

of stock crossing points have
bridges or culverts to exclude
dairy cows.

Nutrient management & data collection

**Data was collected from
94.1% farmers
and 100% of these
dairy farms**

have received nitrogen loss
benchmark information.



10,614
nutrient budgets were processed and
nitrogen information provided to farmers.

This represents 94.1% of the industry and is a significant gain
from the 56% reported in the first year of the Accord.

Effluent management



176
Rural professionals

are now Certified Nutrient Management
Advisors (accumulating total).

100%
of farms



have been assessed for
effluent management
practices.

Conversions



91.3%
of dairy farm conversions

complied with environmental standards before
supply commenced.



**A Warrant
of Fitness**

has been developed to
assess effluent infrastructure.

What we're working on....



Installing water meters on 85% of all dairy farms by 2020.

Currently 51.5%



Collecting nutrient management data from 100% of dairy farms (currently 94.1%).



Having riparian management plans for 50% of dairy farms with waterways (currently 24%).



DairyNZ is continuing to invest in research programmes that seek to improve environmental performance

during the critical winter period such as the Southern Wintering Programme and Good Management Plans delivered through the Sustainable Milk Programme.

Commitment to getting it right

Engagement by farmers and the rural professional community that works alongside them to meet Accord requirements is very high, as evidenced by the commitment to training, assessment, and implementation on farm.

Four Years On...

In the following sections we report back on our progress on the key commitments of the Sustainable Dairying; Water Accord and what we have achieved during its four years of operation. It also reflects on key lessons learnt, and these important performance insights are being used to shape the future direction of the Accord process.

Key to target status symbols



ACHIEVED











IN PROGRESS



NOT REPORTED

Four years on – summary performance results

OBJECTIVE		2016/17 RESULTS
Riparian management		
100% of stock exclusion of the length of waterways present on dairy farms by 30 May 2017		IN PROGRESS (Stock exclusion present along 97.5% or 24,744km of Accord waterways)
100% of regular stock crossing points are either bridged or culverted by 31 May 2018		IN PROGRESS (99.7% achieved)
100% stock exclusion of all wetlands identified by a regional council as at 31 May 2012 by 31 May 2014		Performance against target cannot be measured due to incomplete data
50% of dairy farms with waterways will have a riparian management plan by 31 May 2016		IN PROGRESS (24.0% achieved)
All of the farms requiring a riparian management plan will have completed half their riparian plan commitments by 31 May 2020		Performance against target cannot be measured due to incomplete data
Riparian guidelines completed for all regions by 31 May 2016		ACHIEVED
Nutrient management		
Nutrient management data collected from 100% of dairy farms by 31 May 2015		IN PROGRESS (Data collected from 94.1% of dairy farms)
Nitrogen loss and nitrogen conversion efficiency performance information reported back to all dairy farms by 30 November 2015		ACHIEVED
50% of Fertiliser Association of New Zealand member company nutrient management advisers are certified by 31 May 2014		ACHIEVED
Effluent management		
100% of farms are being assessed		ACHIEVED
A farm dairy effluent Warrant of Fitness scheme available as tool for farmers by 31 May 2014		ACHIEVED
Water use management		
85% of all dairy farms to install water meters by 2020		IN PROGRESS (51.5% ACHIEVED)
Conversions		
All new dairy farm conversions comply with environmental standards before milk supply commences		IN PROGRESS (91.3% farms achieved compliance)



Riparian Management

The Accord expectations are that:

- dairy farms will exclude dairy cattle from significant waterways and significant wetlands
- riparian planting will occur where it would provide a water quality benefit
- the crossing of waterways by dairy cows will not result in degradation of those waterways.

Stock exclusion

Dairy processing companies reported that during the 2016/17 season, 8,042 dairy farms had Accord waterways measuring 25,359km in total*. Stock have been permanently excluded from 24,744km (or 97.5%) of these Accord waterways. This represents a small increase in the relative proportion of Accord waterways that are now stock excluded (from 97.2% in the 2015/16 season).

The absolute length of Accord waterways with stock exclusion is on a lower baseline than previous years, which is not from less actual fencing nationally, but the consequence of changes to the way in which waterways across dairy farms are classified since the 2015/16 season. These classification system updates have resulted in approximately 1,579km of previous Accord waterways with permanent stock exclusion being omitted from the scope of this year's audit. Had these waterways been included the total length of permanently excluded waterways on dairy farms would have increased by 104km on last year (or 0.4%).

The number of farms receiving dispensations from permanent fencing requirements increased slightly from 96 to 135 but represents less than one in 50 farms with Accord waterways (or 1.7%). Please note that farms receiving dispensations must still exclude stock from waterways with temporary fencing.

Stock crossings

Dairy processing companies have identified that of the 11,217 dairy farms assessed as part of the 2016/17 audit process, 7,422 dairy farms had regular stock crossing points.

Dairy processing companies identified 39,179 regular stock crossing points in total, of which 39,076 (or 99.7%) were either bridged or culverted to exclude dairy cows. This means the number of farms with regular stock crossing points reduced by 401 on the previous season, with the total number of stock crossing points also reducing by 5,492.

To ensure greater reporting rigour, the estimate of regular crossing points has been revised to ensure consistency across dairy processing companies. In past seasons, dairy processing companies have reported on regular crossing points of both Accord and/or non-Accord waterways. For the 2016/17 season dairy processing companies have reported on regular crossing points for Accord waterways only. This new approach will enable us to provide greater reporting consistency and transparency regarding the state of Accord waterways by enabling direct year-on-year comparisons. The change does however make it difficult for us to directly compare the 2015/16 and 2016/17 results. In particular, while we think the reduction in the number of regular crossing points that occurred during 2016/17 may be attributable to farmers using alternative routes (which do not involve waterway crossings) to move their stock from the paddock to the milking shed, we cannot definitively say this is the case.

*The waterways data reported in this section does not account for the Taranaki region.

TARGET

100% exclusion of the length present on dairy farms by 31 May 2017



IN PROGRESS
(Stock exclusion is present on 97.5% of the length present on dairy farms)

TARGET

100% of regular stock crossing points are either bridged or culverted by 31 May 2018



IN PROGRESS
(99.7% achieved)

Significant wetlands

Previous Progress Reports have commented on the challenges associated with measuring progress towards achieving the Accord's commitments to exclude 100% of stock from all wetlands identified by a regional council (as 31 May 2012) by 31 May 2014. This is due to several factors, most notably the absence of a nationally consistent definition of a "significant" wetland.

The sector cannot define "significance" without community engagement and an understanding of catchment values for wetlands. DairyNZ and NIWA research stresses that wetlands are highly valuable for a range of water quality and biodiversity benefits. So, until a national definition for significant wetlands (a wetland which would require stock exclusion) is established, important measures of water quality on dairy farms cannot be reported on to meet the Accord's Audit Standards. However, it is important to emphasise that the majority of Accord partners are including comprehensive wetland data in the information they provide for audit purposes. The fact that this data cannot be classified in the manner originally envisaged by the Accord does not mean that significant wetlands are not being protected.

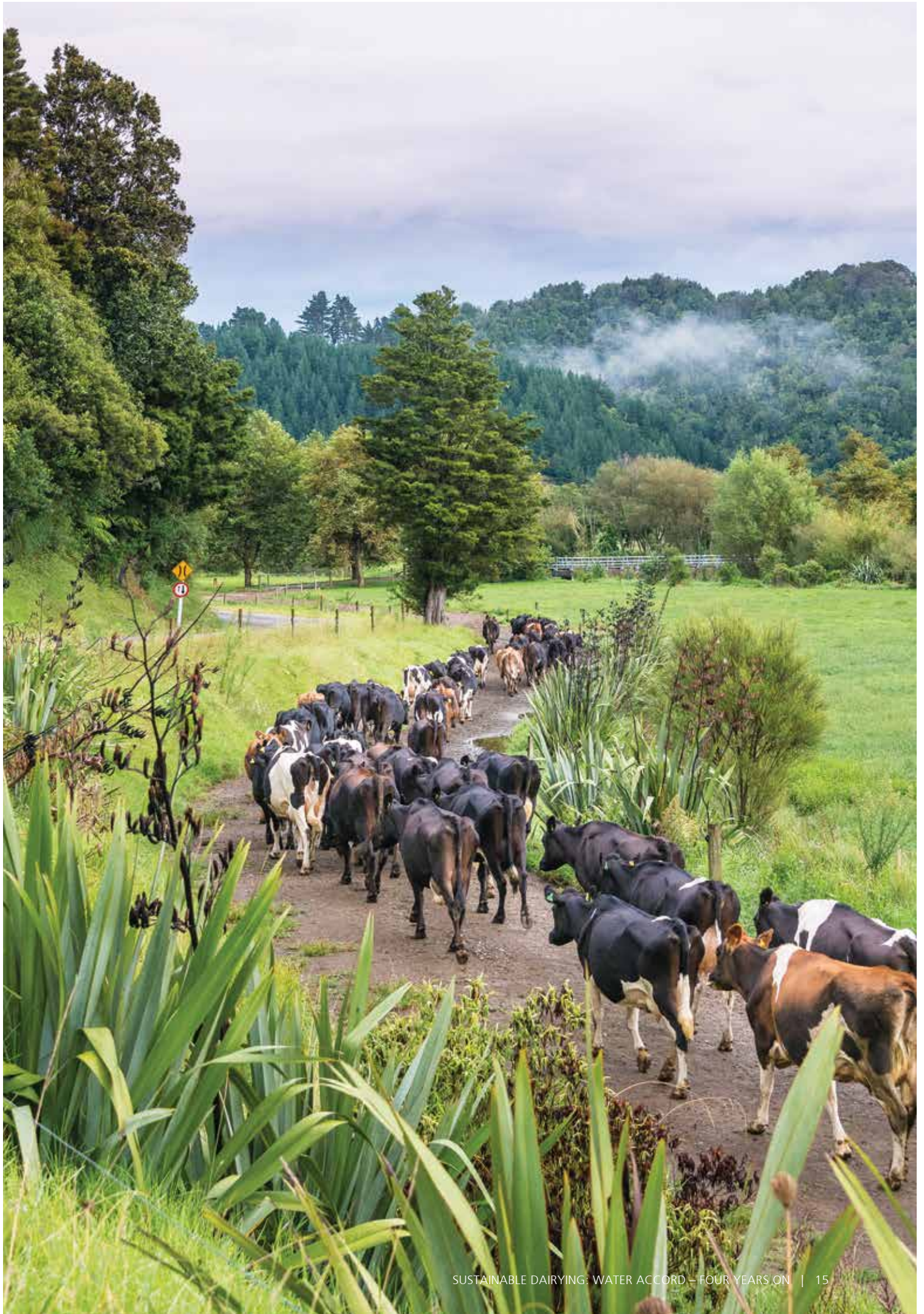
Irrespective of the data challenges, the dairy sector is continuing to lead and invest in a range of programmes to improve wetland management, including the Living Water Programme and the Wetlands Dairy Strategy, and the new *Dairy Tomorrow* Strategy. In addition, DairyNZ is working on a range of projects to encourage the development of wetlands. This includes partnering with Overseer, NIWA and AgResearch to improve Overseer's natural wetlands module and ensure wetlands are recognized in nutrient budgets. DairyNZ is also working with NIWA and regional councils to deliver the *Interceptor Project* to improve the design and performance of constructed wetlands.

TARGET

100% stock exclusion of all wetlands identified by a regional council as at 31 May 2012 by 31 May 2014



Performance against target cannot be measured due to incomplete data





Riparian planning

The Accord committed the dairy sector to ensuring that 50% of farms with waterways had a riparian management plan in place by 31 May 2016, with these farms completing half of their management plan commitments by 31 May 2020.

As noted in the introductory section of this report, riparian management plans are being integrated within Farm Environment Plans (FEPs) which is a positive development. However, the current transition process has compounded some of the measurement challenges touched on in earlier sections of this report.

The data indicates that the proportion of farms with riparian management plans has decreased from 27.0% in 2015/16 to 24.0% this season. This result is attributable to the tighter data management standards that DairyNZ applied when assessing this season's data, particularly the need to ensure that riparian plans were not being double-counted. In this respect, this season's result is more robust than previously reported data. This result obviously falls short of the sector's target that 50% of farms with waterways will have riparian plans in place by 31 May 2016. Consequently, DELG will continue working closely with Accord Partners to develop a plan to align the riparian management plan target with the sector's Dairy Tomorrow commitments, and the innovations that are happening on the ground in relation to the development of Farm Environment Plans (FEPs).

In the meantime, DairyNZ continues to actively promote effective riparian planting through its 13 regionally-tailored guides, and through its DairyNZ's general sustainability and land management programmes which are reported on in the nutrient management section of this report.

TARGET
50% of dairy farms with waterways will have a riparian management plan by 31 May 2016



IN PROGRESS
(24.0% achieved)

TARGET
All of these farms will have completed half of their riparian plan commitments by 31 May 2020



Performance against target cannot be measured due to incomplete data

A close-up photograph of a cow's nose and mouth as it eats green grass. The cow's nose is dark and textured, and the grass is vibrant green. The background is dark and out of focus. A blue vertical bar is on the left side of the page.

Nutrient Management

The Accord expectation is that:

- dairy farmers will manage nitrogen (N) and phosphorus (P) loss from dairy farming systems, acknowledge the need to manage within nutrient loss limits, and pursue continuous improvement in nutrient use efficiency.

Nutrient management data collection

Every dairy company has developed programmes to collect nutrient management data from their farmer suppliers and model these using agreed protocols (OVERSEER Best Practice Input Standards). Data collection and verification systems for the 2016/17 season continue to improve and build on the progress made in previous years.

During the 2016/17 season, nutrient management data was collected from 94.1% of Accord dairy farms, with every farm receiving performance and benchmarking information. To put

this result in context: an additional 1,097 farms received performance and reporting information which is an excellent result.

Although this result is slightly short of the Accord target of collecting data from 100% of farms by 31 May 2015, significant progress has been made as a direct result of the continuing investments that dairy processing companies are making to improve nutrient management performance on-farm.

Average nitrogen loss by region

Since the Accord's launch the sector has been steadily building a comprehensive dataset on nitrogen (N) loss and N use efficiency. The data generated by the 2016/17 audit has been included in the dataset and used to produce the regional average N leaching loss data in Table 1. The observed variance in regional N leaching loss is a function of several factors, including soil type, drainage characteristics (including rainfall and/or irrigation) and farming practices.

This data has also been used to derive a national average N-loss which is 41 kg N/ha/yr and is a slight increase on the 39 kg N/ha/yr reported last season.

TARGET
Nutrient management data collected from 85% of dairy farms by 31 May 2014, and 100% by 31 May 2015



IN PROGRESS
(Data collected from 94.1% of dairy farms)

TARGET
Nitrogen loss and nitrogen conversion efficiency performance information reported back to all of dairy farms by 30 November 2015



ACHIEVED*

**The raw data indicated that nutrient management information was reported back to 99.9% of farmers but when considering the potential margin of error, and following discussions with the independent auditors, DairyNZ has determined that this target will be reported as achieved.*

Table 1. Regional average nitrogen (N) leaching loss (kg N/ha/yr) and sample size across 13 regions based on 2016/17 season data.

	Average N-loss (kg N/ha/yr)	Sample size (number of farms)	Rolling average over the last four seasons* (kg N/ha/yr)
Northland	26	825	24
Auckland	21	262	20
Waikato	35	3735	35
Bay of Plenty	44	638	43
Gisborne/Hawke's Bay	38	81	36
Taranaki	54	1565	53
Manawatu	31	803	29
Wellington	37	167	34
Tasman	73	111	71
Nelson/Marlborough	37	47	40
Canterbury	59	1143	58
Otago	38	399	38
Southland	35	851	34

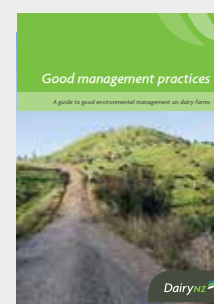
* The rolling average N loss is calculated by taking the annual results as processed through the relevant version of Overseer at that time. It is not a true weighted average, it is an average of individual farm results.

**The Westland region had only two farms reported this season so the average N loss has not been reported to protect the anonymity of the farmers' information and because it is a small sample size.

Managing phosphorus loss risk

Excluding stock from waterways, ensuring crossings are bridged or culverted, implementing effective riparian management, and adopting good management effluent practices produce a number of co-benefits, particularly in relation to mitigating phosphorous (P) loss risks on farm. Other practices that influence P-loss risk include the management of tracks and races, and wintering practices.

DairyNZ continues to invest in several research programmes that seek to improve environmental performance during the critical winter period such as the Southern Wintering Programme and Good Management Plans delivered through its Sustainable Milk Programme. It also continues to provide a range of technical resources to assist farmers in understanding how phosphorus enters, cycles through, and leaves a dairy farm.



Nutrient management adviser certification

Nutrient management adviser certification continues to grow with 176 rural professionals certified, with a further 71 professionals going through the certification process at the date of this report. The work of the Accord's supporting partners, the Fertiliser Association, Ballance and Ravensdown, has been instrumental in delivering this positive result.

Nutrient management training

Massey University's Fertiliser and Lime Research Centre (FLRC) runs two Sustainable Nutrient Management (SNM) courses which attracted 235 participants in the 2016/17 season, with 115 registering for the Intermediate and 80 for the Advanced SNM courses respectively.



The Intermediate SNM course provides participants with a working knowledge of the assessment of nutrient requirements of a range of agricultural systems, including a consideration of best practices for environmental protection. The Advanced SNM course provides an advanced knowledge of nutrient cycling and loss pathways in New Zealand's farming systems, equipping participants with the skills to develop solutions for systems that have unacceptable nutrient loss to the environment.

Farmer extension activities

Farmers and rural professionals also continued to access a broad range of DairyNZ extension activities during the 2016/17 season including courses on implementing sustainable land management practices. These activities play an important role in supporting farmers to understand the rapidly changing policy context in which they are operating, and access and apply new knowledge and technologies to their farm systems. They also play a pivotal role in creating a culture of life-long learning within our sector.

Effluent Management



The Accord expectations are:

- dairy farms will comply with regional council effluent management rules and/or resource consent conditions
- effluent systems installed on dairy farms will be fit-for-purpose and able to achieve 365-day compliance with applicable rules.

Effluent system assessment and guidance

All Accord dairy processing companies have programmes in place to assess the effluent systems of their farmer suppliers on a three-yearly basis, with several companies assessing every farm every year. The programmes are designed to identify risks of non-compliance with regulatory requirements. All dairy processing companies have reported on the farms assessed in the four-year period to 31 May 2017. While it is pleasing to see that an assessment target has been achieved, the sector recognizes the importance of delivering continuous improvements in effluent management practices on-farm, and reducing the rates of significant non-compliance.

TARGET

100% of farms are being assessed



ACHIEVED IN
MAY 2015*

Accreditation of effluent system designers

There are now 20 companies accredited, with all regions having access to an accredited company. Interest and awareness in the accreditation programme remains high, with key stakeholders increasingly recommending accredited companies. The list of accredited companies can be found at www.effluentaccreditation.co.nz.



Professional training provided

A wide variety of effluent system design and management courses continued to be offered nationwide. This includes DairyNZ's new Farmspread programme which has been developed to provide dairy effluent professionals with a good working knowledge of the good practice requirements for applying dairy effluent onto land.

The following table outlines the specific effluent management courses that were offered to rural and effluent service industry professionals during the 2016/17 season.

Table 2. Training courses offered to the effluent services industry and other rural professionals

Training	Date first offered	Attendees* (cumulative number from course commencement date)
Massey Farm Dairy Effluent Systems Design & Management	2011	221
QCONZ Dairy Effluent WOF	2014	82
DairyNZ Dairy Effluent Storage Calculator	2012	236
DairyNZ Farmspread	2017	20

* The raw data indicated that 99.5% of farms were being assessed but when considering the potential margin of error, and following discussions with the independent auditors, DairyNZ has determined that this target will be reported as achieved.

On farm training

The Primary Industry Training Organisation delivers the New Zealand Certificate in Agriculture (Milk Harvesting – Level 3), which includes the effluent management unit standards previously offered through its Effluent Management Planning Programme. During the 2016/17 season 396 trainees completed the Certificate programme, with a further 288 trainees working towards completion. DairyNZ also offers range of effluent management courses which cover topics such as dairy effluent system design, pond construction, storage and application. It is encouraging to see demand for effluent management training remains strong.



Effluent warrant of fitness

The Dairy Effluent Warrant of Fitness (WOF) programme continues to go from strength to strength, offering dairy farmers a voluntary and independent inspection of their effluent infrastructure and management practices. The WOF programme aims to ensure effluent systems are capable of achieving regulatory compliance 365 days a year.

The WOFs are conducted by accredited assessors who are fully certified as Warrant of Fitness Assessors. Every assessor has completed the Farm Dairy Effluent Warrant of Fitness Course and a subsequent field assessment. 130 WOFs were conducted in the 2016/17 season which is a significant increase on the 42 WOF's undertaken during the previous season.

Additional information on the WOF programme is available at www.effluentwof.co.nz.



TARGET
A farm dairy effluent Warrant of Fitness scheme available as a tool for farmers by 31 May 2014



ACHIEVED

Rates of significant non-compliance

Every regional council undertakes annual monitoring of farm dairy effluent systems and management practices in relation to a range of permitted activity rules and consent conditions.

In the 2016/17 season, the rate of significant non-compliance (SNC) on monitored farms at the national scale is 5.31% which represents a small 0.11% increase on the previous season.

Rates of SNC continue to vary between seasons, as fully described in Appendix 1. Comparison between regions also remains challenging due to different rules frameworks and monitoring regimes. We now have four years of Accord reporting data to help derive SNC trends in each region, rather than focus on regional SNC percentage rates. We report on SNC trends because percentage rates can be misleading due to the risk-based selection approaches some councils use to inform their monitoring regimes. Regional trends are outlined in Table 3 below.

Table 3. Trends in dairy effluent SNC for three Accord years across regions

Region	Trends*	Comments
Northland	Variable	Incidence of SNC has increased from 14% in 2015/16 to 18% in 2016/17.
Auckland	Improving	Good improvement with incidence of SNC dropping by 10% in 2016/17.
Bay of Plenty	Improving	Good improvement over the last 3 years with the incidence of SNC dropping from 5% to 1.4%.
Waikato	Stable	Incidence of SNC has held steady at approximately 10% on average over the last two seasons.
Hawke's Bay	Stable	Incidence of SNC remains approximately 2% on average.
Taranaki	Stable	Incidence of SNC remains approximately 1% on average.
Horizons	Variable	Incidence of SNC has increased from 1% in 2015/16 to 4.98% in 2016/17.
Greater Wellington	Stable	Incidence of SNC remains approximately 3% on average.
Tasman	Stable	Incidence of SNC remains steady at approximately 2.96% on average.
Marlborough	Improving	Good improvement over the last 3 years with the incidence of SNC dropping from 14% to 11.11%.
West Coast	Stable	Incidence of SNC has reduced to 0.34%.
Canterbury	Stable	Good improvement over the last 3 years, dropping from 5.5% to 2.53%.
Otago	Stable	Incidence of SNC remains at 2.7% on average.
Southland	Stable	Trend remains stable although incidence of SNC has increased this year from 1.7% in 2015/16 to 4.14%.

* Definition of trends: 'Improving' more than 3% shift in SNC; 'Stable' no more than 3% shift in SNC; 'Worsening' more than 3% shift and trend in same direction, 'Variable' shifts of greater than 3% each year (up and down)

Water use management

The Accord expectations are:

- dairy sheds will use no more water for wash down and milk cooling than that necessary to produce hygienic and safe milk
- irrigation systems will be designed and operated to minimise the amount of water needed to meet production objectives.

Water metering on dairy farms

Dairy processing companies reported that water meters were installed on an additional 76 farms during the 2016/17 season, taking the total number of farms with meters to 5,777 (or 51.5%). This adoption rate is lower than expected and means there is a sizable challenge ahead to meet the target of 85% of all dairy farms installing meters by 2020. This is something that DELG will continue to monitor and discuss with the Accord's accountable and supporting partners.

TARGET

85% of all dairy farms to install water meters by 2020



IN PROGRESS
(51.5% ACHIEVED)

Water Volume Study

As reported last year, the dairy sector has taken a leadership role commissioning a recent study which measured water use on over 100 dairy farms in the Waikato, Manawatu, and Canterbury regions. The study involved measuring the volume of water used for stock drinking water, dairy shed use and irrigation water use. From this, regional patterns of water use were calculated and modelled to predict water use on irrigated and non-irrigated farms. The results of this study have now been presented in the following journals:

Water use on non-irrigated pasture-based dairy farms: Combining detailed monitoring and modelling to set benchmarks (Journal of Dairy Science, 100:828-840)

Temporal and spatial water use on irrigated and non-irrigated pasture-based dairy farms (Journal of Dairy Science, 100: 6772-6784)

The study has produced interesting insights into the estimated amount of water that is lost from the water distribution systems delivering water to troughs for stock drinking water. It has also found that existing computational models used to predict milking parlour, corrected stock drinking water, and total water use perform well for non-irrigated dairy farms but less so for irrigated farms.

Training, certification, and accreditation

As noted earlier in this report, IrrigationNZ is one of the Accord's support partners. It coordinates training and development activities within the irrigation service sector (more information is available at www.irrigationaccreditation.co.nz). IrrigationNZ plays a lead role in the delivery of two Accord commitments:



- promoting Irrigation Good Management Practice
- developing and promoting capacity building and a good practice assurance programme that builds excellence in the design, installation, commissioning of irrigation infrastructure and the operation of irrigation systems.

During the 2016/17 season IrrigationNZ worked to achieve these commitments by:

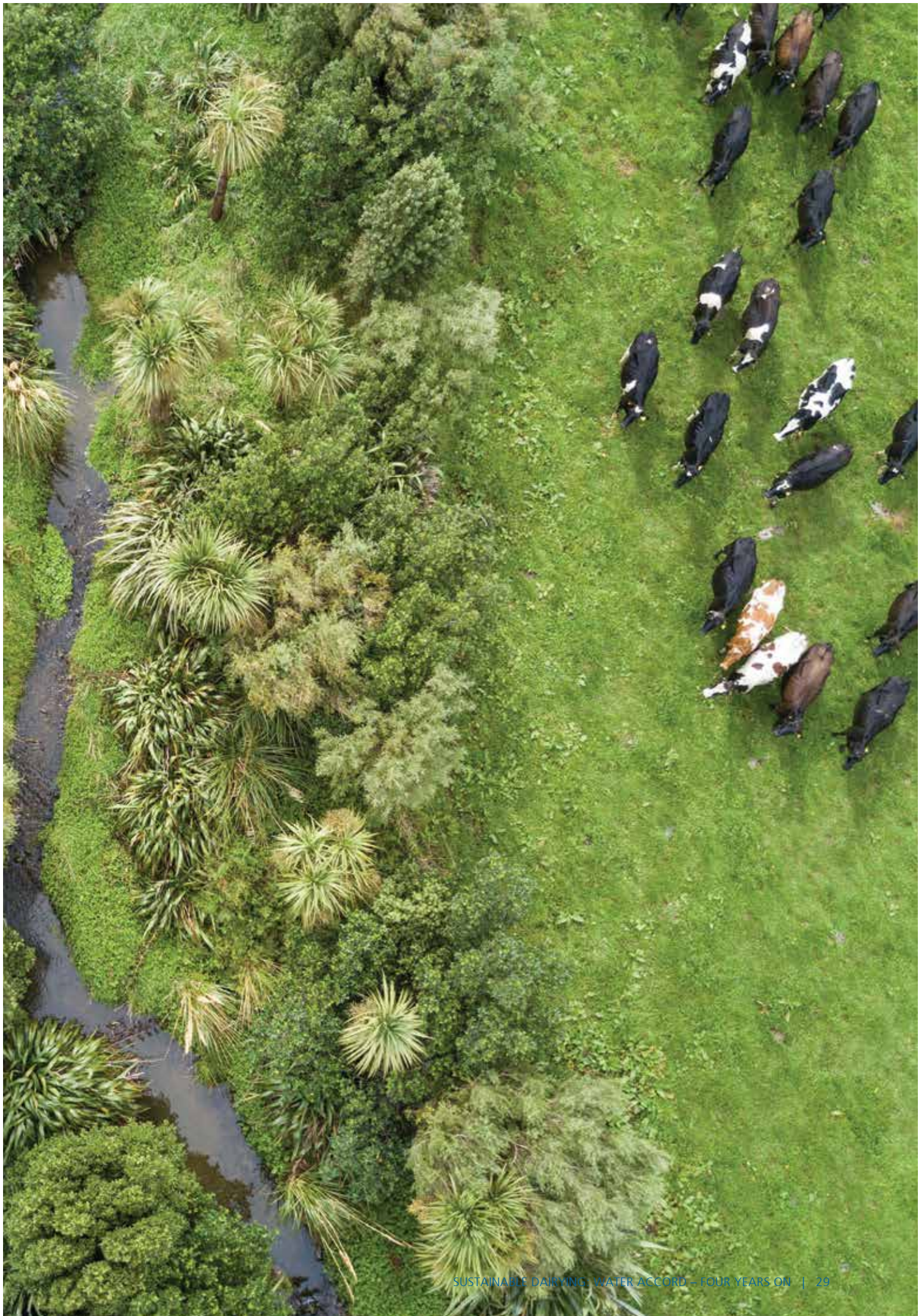
- monitoring and reporting the number of companies with accreditation for irrigation system design. There are now six companies accredited for irrigation design, which make up approximately 70% of the market share.
- delivering the following National Certificate Programmes:
 - Irrigation Design programme, with eight people graduating from the 2016 intake and a further 15 candidates enrolled for the 2017 intake;
 - Irrigation Performance Assessment programme, which has eight candidates expected to complete it in March 2018;
 - Irrigation Management, which has nine candidates expected to complete it in April 2018.

- delivering Irrigation System Operator Training to over 600 people from Katikati (BOP) to Riversdale (Southland) through one-day Irrigation Manager Training and half-day topic-specific workshops.
- coordinating the annual calibration of irrigation systems and a five-yearly audit by a certified evaluator. In early 2017, IrrigationNZ successfully delivered the 'Summer Evaluations Project' in the Ashburton district, with 131 farms visited and 244 irrigation systems evaluated. This programme is being repeated in Canterbury and Hawke's Bay in 2018.
- developing online resources to enable irrigators to easily determine and benchmark their system performance – IrrigationNZ's Bucket Test App now has over 700 users, with 1200 test reports generated to date.

DairyNZ extension activities

Water supply is obviously a vital component of any dairy farm operation. Making sure systems are working efficiently can save water, time, and money. DairyNZ therefore continues to support and promote a range of smart water use events as part of its regional extension programme, providing technical information on a range of water use management issues including:

- Smart water use in the milking shed
- Water meters and monitoring
- Smart water use – developing a short form action plan
- More information is available at www.dairynz.co.nz/environment/water-use.



Conversions

The Accord expectations are that:

- new dairy farms establish and operate using good practice at the outset to minimise potential negative consequences on water values and interests.
- new dairy conversions will comply with all relevant regional plan rules and/or hold necessary resource consents.

As reported last year, dairy processing companies have introduced programmes that outline a range of requirements to be met before milk supply commences. In most instances, this involves a trained company assessor visiting farms and working with the farmer to ascertain whether requirements, which focus on environmental good management practices for effluent, waterways, nutrient management, and other relevant regulatory conditions, have been met. DairyNZ’s Guide to Responsible Dairy Conversions also continues to be a popular resource and was downloaded 163 times during the 2016/17 season.

The audit data indicates that 298 farms have been converted to dairy during the period May 2013 to May 2016. Of these, 91.3% are fully compliant with environmental standards. This is positive result, with compliance rates increasing by 1.5% on the previous season. However, it is slightly below our 100% target rate.

TARGET
All new dairy farm conversions comply with environmental standards before milk supply commences



IN PROGRESS
(91.3% compliance)

Appendix 1: Effluent significant non-compliance data supplied by regional councils and unitary authorities for the 2016-17 season

Region	Total farms in region	No. of farms monitored	Description of monitoring programme	Significant Non-Compliance Number of farms and %	Main reasons for significant non-compliance
Northland	919	919	<ul style="list-style-type: none"> All farms inspected at least once annually. Routine compliance visits are non-notified. All monitored between August and early December. Do "whole of farm" dairies, feed pads, standoff, silage, dead stock disposal etc. Sample whenever there is a discharge. 	166 farms (18.06%)	<ul style="list-style-type: none"> Untreated discharges to water from feed pads, underpasses, storm water bypass, entry/exit races. Land application issues. Discharges to water, excessive ponding, and overland flow, not irrigating when should be. Inadequate management. Broken or blocked pipes, sump overflow, pump maintenance. Unauthorised discharge of treated effluent to water. Water quality test results not meeting conditions of resource consent. Inadequate contingency storage.
Auckland	296	68	<ul style="list-style-type: none"> Risk based prioritisation 	2 farms (2.94%)	<ul style="list-style-type: none"> Silage leachate
Bay of Plenty	660	346	<ul style="list-style-type: none"> Dairy sheds are inspected at different frequencies according to the risk associated with the particular activity. Risk ratings take into account the type of treatment, water management areas, point of discharge and the compliance history of the consent holder. Those farms determined to be high risk are inspected annually, while medium and low risk farms are inspected every two or three years respectively. Dairy farms are spread around the entire region and inspections are undertaken annually throughout spring. This is run as a coordinated project which utilises resources from across the entire Regulatory Compliance Team. To minimise the impact on farmers, the compliance work is undertaken after the calving season and contact is made with the farmers upon entry to the farm. 	5 farms (1.45%)	<ul style="list-style-type: none"> Breach of an abatement notice. Discharge of dairy effluent to a watercourse. Serious/excessive ponding from an irrigator.

Region	Total farms in region	No. of farms monitored	Description of monitoring programme	Significant Non-Compliance Number of farms and %	Main reasons for significant non-compliance
Waikato	~ 4500	1174	<ul style="list-style-type: none"> Most Waikato dairy farmers operate their dairy effluent irrigation systems under the council's permitted activity rules for managing farm dairy effluent. These rules make it possible for farmers to apply effluent to land without a resource consent. However, they must meet all of the conditions of the rules. The council monitors compliance with the rules and assesses a system with a view to compliance 365 days a year, not just on the day of inspection. Usually 24-48 hours' notice is provided to enable the owner to be present. The visits cover more than effluent management, and includes water takes and other consents held by the farm. Notice is generally not given prior to the site visit when there has been previous non-compliance or when a complaint has been made by a member of the public. 	104 (8.86%)	<ul style="list-style-type: none"> Ponding. Inadequate storage. Lack of staff training.
Hawke's Bay	80	80	<ul style="list-style-type: none"> Every farm is visited every year. 	2 farms (2.50%)	<ul style="list-style-type: none"> Failure to install a lined effluent storage pond. Continued use of an unlined pond. Failure to keep records required by the consent. Effluent spill.
Taranaki	1721	1721	<ul style="list-style-type: none"> All farms annually inspected, all discharge to water sampled biannually. All non-compliant systems re-inspected with possible follow up inspection undertaken at the end of the monitoring season. 	15 farms (0.87%)	<ul style="list-style-type: none"> Annual sampling and best practice not being observed resulting in significant failure and non-compliance with resource consent conditions.
Horizons	934	542	<ul style="list-style-type: none"> Plans for the 2016/17 season were to monitor all farms. However, due to workload pressures it was quickly decided this was not achievable. The priority was given to assessing all farms with discharge to land consents and Land Use Consents for intensive farming (relating to dairy farms in certain catchments) and then to visit as many farms as possible through random selection before the end the financial year. A risk-based process has now been implemented to ensure this year the council is monitoring farms that have a higher risk of non-compliance, those with land use consents and those not visited the previous season. 	27 farms (4.98%)	<ul style="list-style-type: none"> Ponding. Runoff at the irrigator. Overflowing ponds, sumps and underpass discharges to water.
Greater Wellington	169	169	<ul style="list-style-type: none"> All farms are monitored annually. 	5 farms (3%)	<ul style="list-style-type: none"> Overflowing ponds. Winter milking with no storage. Ponding (irrigator).

Region	Total farms in region	No. of farms monitored	Description of monitoring programme	Significant Non-Compliance Number of farms and %	Main reasons for significant non-compliance
Tasman	134	134	<ul style="list-style-type: none"> All farms are monitored at least once per season. Every month during the main dairy season (September-April) a random sample of farms are taken from council's dairy database. A phone call will be made to the farmer the night prior to the inspection. This is done due to the wording of the rules to which farm dairy effluent collection/disposal are assessed against, requires the farm operator to answer a number of questions. If the farmer is unavailable, they are usually interviewed over the phone or the inspection will be postponed and this process followed at a later date. Farms with a history of SNC or if first inspection is graded NC or SNC more than one inspection will take place. These follow-up inspections are strictly unannounced. 	4 farms (2.96%)	<ul style="list-style-type: none"> Ponding. Failure of main line carrying effluent from storage pond to the disposal field. Insufficient contingency storage. Failure to ensure storage facilities are sealed.
Marlborough	54	54	<ul style="list-style-type: none"> Inspections are undertaken using the cold calling method. On approach or arrival to the farm, the compliance officer attempts to find a staff member to alert them to being on the property and to discuss the effluent system. 	6 farms (11.11%)	<ul style="list-style-type: none"> Ponding. Discharge of effluent within 20m of a waterway. Effluent storage system located within 20m of a waterway. No effluent storage.
West Coast	391	293 (75% of all farms)	<ul style="list-style-type: none"> All farms with a discharge to water consent (from treatment ponds) are visited annually. Permitted Activity (PA) farms are visited according to their compliance rating from the last season. If the farm was non-compliant the year before, it will continue to be visited annually (or more often dependent on the issues) until council is satisfied all the issues that made the farm non-compliant have been addressed. If PA farms are continually compliant then they will only be visited once every two years. Some farms will be rated as high risk (usually due to poor infrastructure or management) and will be monitored more frequently. 	1 farm (0.34%)	<ul style="list-style-type: none"> Overflowing pond.

Region	Total farms in region	No. of farms monitored	Description of monitoring programme	Significant Non-Compliance Number of farms and %	Main reasons for significant non-compliance
Canterbury	1309	790	<ul style="list-style-type: none"> Targeted monitoring using risk-based approach. Risk takes a number of factors into consideration, including sensitive area, farm/ herd size and previous compliance history. In addition, some monitoring of farms not visited for several seasons is also undertaken and in response to pollution hotline calls. 	20 farms (2.53%)	<ul style="list-style-type: none"> Incorrect storage. Overflowing pond. Incorrect storage of solids. Faulty equipment. Effluent incorrectly discharged. Backflow test report no actioned. Ponding.
Otago	476	467	<ul style="list-style-type: none"> For the 2016/17 season all farms were intended to be monitored, but 9 farms were mistakenly omitted from the monitoring programme. 	13 farms (2.7%)	<ul style="list-style-type: none"> Ponding and/or run off to water due to irrigating on saturated soils. Farming equipment.
Southland	900	941	<ul style="list-style-type: none"> All farms monitored. 	39 farms (4.14%)	<ul style="list-style-type: none"> Ponding. Discharge of dairy shed effluent to water. System overflow.
TOTALS		7698		409 (5.31%)	

Auditor's statement

Telarc Ltd carried out an independent audit of the Sustainable Dairying: Water Accord (SDWA) data collected for the 2016/17 season. The assessment was performed in accordance with applicable Telarc Ltd standard operational procedures which comply with the requirements of ISO 17021-1:2015.

Telarc Ltd was engaged to perform a review of the systems and practices used for data collection by the Accord partners, and to perform a check of the reliability of a sample of farm-level information (through on the ground verification of reported information). The assessment programme included review of DairyNZ specific SDWA objectives, dairy company specific SDWA objectives, as well as the dairy company data collection and consolidation processes at six dairy processing companies, and the on-farm verification of 78 data sets. The assessments were performed during the period December 2017 to March 2018. In line with previous years, the scope of the assessment was focused on data from the current season 2016/17 only, and the review was performed against expectations and commitments defined in the following standards:

- The 2015 version of the Sustainable Dairying: Water Accord.
- Sustainable Dairying: Water Accord Audit standard (DairyNZ requirements) v7, December 2017.
- Sustainable Dairying: Water Accord Audit standard (Dairy Company requirements) v9, December 2017.

The assessment also reviewed the reporting of Sustainable Dairying: Water Accord information as detailed in:

- Water Accord progress report_4 years on_proof10.pdf
- Water Accord (DNZ Reporting_All_Companies_2016_17).xlsx
- Updated Water Accord (DNZ Reporting_All_Companies_2016_17) (20180403).xlsx
- Refer also to Note 1.

DairyNZ has collated and published benchmarked Accord data from all participating dairy processing companies and verified information received from supporting partners such as fertiliser companies, Irrigation NZ, Federated Farmers and NZIPIM regarding their SDWA commitments. A number of new Accord requirements became operable in the 2016/2017 season. The assessment found that, a number of these new commitments, and several of the existing commitments, were not achieved.

As in previous years, DairyNZ again used a structured approach to collect and consolidate dairy company data for around 11,400 farms. At the dairy processing companies, processes are becoming more robust for the collection, management and verification of the supplied data. The accountable partners of the Accord have made further progress in meeting Accord requirements, and report an increase in the number of installed water meters.

Progress continues to be made by the dairy processing companies and their suppliers with respect to the remaining Accord commitments. It was observed that changes to data gathering methodologies by dairy processing companies, and the non-inclusion of some data in the Accord reporting raises uncertainty in the reported figures. In addition, at the farm level, a number of factors (e.g. on farm changes since the last verification of data, accuracy of recording, interpretation of definitions etc.) will mean reported figures related to Accord targets will never be 100% accurate at any specific point in time. (i.e. figures relating to; percentage of length of stock excluded waterways/area of stock excluded significant wetland, length of dispensations, percentage of regular stock crossings that have bridges or culverts, the percentage of farms with water meters).

Six accord targets have not been fully met for the 2016/2017 season; note: two of these were within 0.5% of the target and have been noted as Achieved in the annual report. Areas of the Accord where objectives have not been fully met were identified as being related to Riparian and Nutrient management, Effluent Management, and Conversions.

- Exclusion of the length of waterways is noted 97.5% against a target of 100% stock exclusion of the length of waterways present on Dairy Farms by 31 May 2017.
- Approximately 24 percent of dairy farms with Accord waterways were able to be verified as having established riparian management plans against a target of 50% by 31 May 2016.
- The collection of nutrient data from farmers is noted to be 94% for the 2016/2017 season. This total falls short of the Accord commitment of 100% of Dairy Farms by 31 May 2015.
- The reporting of Nitrogen Loss and Nitrogen conversion efficiency performance to 100% of dairy farms from which data was gathered by 30 November 2015 fell just short (99.9%) of the target. Note: this has been reported as “Achieved” in the report.
- It is reported that 99.5% of the farms were assessed for effluent compliance the 2016/2017 season. This total falls slightly short of the Accord commitment of 100% of dairy farms assessed for effluent compliance by 31 May 2014. Note: this has been reported as “Achieved” in the report.
- The dairy processing companies reported that 91.3% of conversions met Accord requirements against a target of supply 100% compliance prior to supply.

Reports have been provided to DairyNZ and the dairy processing companies that identify improvement opportunities and also performance against the respective audit standards. The findings from these individual reports have been consolidated in an overarching report.

Note 1: Statements in the “Water Accord progress report 4 years on” progress report not assessed by Telarc Ltd. include; financial data, case studies, supporting partner data, and regional council and unitary authority data (e.g. Effluent Non-Compliance and riparian management plan development data).



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