



**MARLBOROUGH
DISTRICT COUNCIL**

Dairyshed Effluent and Stream Crossing Survey 2015/2016

**Technical Report No: 16-001
April 2016**



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File Reference E330-001-004 & E330-001-005 (Record No. 1668513)

MDC Report No. 16-001

ISSN 1179-819X (Online)

ISBN 978-1-927159-66-8

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Executive Summary

Marlborough District Council (Council) has monitored dairy farms in Marlborough since 1994. The dairy sector in Marlborough is relatively small, consisting of 56 farms with a combined herd size of approximately 17,000 cows. Council has been working alongside the dairy industry to improve environmental performance in Marlborough for some time.

During the 2015/16 milking season, the dairy effluent systems on all 56 dairy farms in Marlborough were inspected by Council to check compliance with the plan rules or resource consents. Council also inspected the sites where cows continue to walk through waterways on some farms, to monitor the progress made toward eliminating the use of these waterways by dairy herds.

This report summarises the findings of the 2015/2016 Marlborough Dairyshed Effluent Survey. The purpose of the Dairyshed Effluent Survey is:

- To prevent contamination of groundwater and waterways and the degradation of soil by promoting best practice dairy effluent management
- To gain information on the level of dairyshed effluent compliance in Marlborough
- To ensure compliance with plan rules or resource consent conditions regarding dairy effluent
- To work with farmers who are non-compliant and to provide information about the management of dairy effluent systems working to best practice.

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1. Introduction

This report summarises the findings of the 2015/16 Dairyshed Effluent and Stream Crossing Survey. Council inspects the dairy farms to check compliance with plan rules for dairy effluent or relevant resource consents. In the Marlborough Sounds Resource Management Plan (MSRMP) area 40 dairy farms were checked against the permitted activity plan rules and in the Wairau/Awatere Resource Management Plan (WARMP) area 16 farms were checked against the conditions of their respective resource consent for dairy effluent discharge.

When carrying out the dairyshed effluent inspections, Council also checks any relating components to the dairying activity which may not be specifically included in the dairy effluent disposal rules and resource consents which may have potential to result in environmental effects. This can include, for example, raceway entrances to dairy sheds, silage pits and ofal pits.

The Stream Crossing Survey was started in 2002 to identify the places where dairy cows walk through waterways on farms, these are required to be eliminated from use. The identified sites where dairy cows continue to walk through waterways on the farms are monitored for progress made towards excluding stock through culverts, bridges or alternative access routes. There has been a large reduction in the number of waterways used for dairy cow crossings since 2002 but total exclusion has not yet been met.

1.1. Dairy Effluent Management Nationally

A national criteria for categorising dairy effluent compliance for reporting purposes was created in 2007. All regional councils should be using these criteria to ensure national consistency of compliance grades for dairy effluent systems.

Dairy files are audited every two years to provide independent feedback to each Council on its dairy effluent compliance assessment. The Marlborough District Council continues to annually inspect all dairy farms using the dairy effluent compliance assessment criteria set out below.

The three categories that may be assigned are:

1. Compliance (C)
2. Non-compliance (NC)
3. Significant non-compliance (SNC)

For a system to be assessed as compliant, the compliance officer did not observe any issues of non-compliance at the time of the inspection.

The criteria for assessing a non-compliant classification is that a breach of consent condition or permitted activity rule has occurred but corrective or remedial actions can be undertaken to become compliant.

The criteria for assigning a significantly non-compliant classification are described as follows:

- Unauthorised discharges that may enter water (ground or surface water);
- Unauthorised discharges that have entered water (ground or surface water);
- System inadequacies;
- Multiple non-compliances on site with cumulative effects and
- Breach of an abatement notice;

1.2. Dairy Effluent Management in Marlborough 2015/2016

The 2015/16 Dairy Effluent Survey has continued to use the 'traffic light system' to indicate compliance status against plan rules and resource consent conditions. As per other monitoring programs, the **yellow** technical non-compliance category was introduced this season. The other categories are **green** which indicates compliance; **orange** which indicates environmental non-compliance where corrective or remedial action(s) is required and a time frame for completion has been set, and **red** indicates significant non-compliance.

If a farmer received a technical or non-compliance rating, tasks labelled as 'Action Required' were provided in the compliance report. These are designed to assist farmers by highlighting what parts of their dairy effluent system can be modified or better managed in order to achieve a compliance rating when re-inspected.

Council has received positive feedback from farmers regarding the use of the traffic light system to indicate the compliance rating. The system is easier to understand than using letters to indicate compliance as this has previously been misunderstood.

Appendix A shows an example of a Compliance Report that a farmer received.

In 2014/15 Council introduced non-notified site inspections for dairy effluent inspections, this has been continued through the 2015/16 season. This 'cold calling' method was adopted so that Marlborough District Council was in line with other regional councils throughout New Zealand. On 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. This type of inspection has continued to be well received with only some farm owners wanting clarification on the health and safety requirements when on site.

Following discussion with the dairy industry, the Compliance team are investigating whether to continue cold calling in the 2016/17 dairy survey. An alternative to this is to increase the notification period of the inspection to as much as the day before the inspection. This will be discussed at the annual national dairy audit.

For this survey, Council has continued with the strategy previously put in place to try to increase compliance rates. Firstly, those dairy farms with little or no storage, older less reliable systems and those previously non-compliant were visited first to allow for upgrades or changes to be made throughout the season.

Appendix B outlines a Compliance Officer's approach on each farm visit.

1.3. Washdown Collection, Containment and Application Systems

Most dairy farms in Marlborough have effluent collection systems which consist of a solid separator such as a stone trap, weeping wall or mechanical separator, and a sump and/or a storage facility. Dairy herd sizes vary in Marlborough from as small as 50 cows through to 1200 cows therefore the size and complexity of the effluent systems vary accordingly.

The MSRMP specifies that these systems cannot be within 20 metres of a surface water body or the boundary of a neighbouring property. Marlborough has eight farms which have their collection and containment systems too close to a surface water body. These farmers are required to upgrade their collection system to be more than 20 metres from a surface water body. Alternatively, some farmers have been granted resource consent to allow systems to remain in the current state until November 2016 in order to plan and facilitate an upgrade. As these farms have applied for and been granted resource consent, their effluent systems are compliant.

Four farmers with systems too close to waterways which do not have resource consent to retain these systems in the current locations have been rated as significantly non-compliant. Enforcement action may be required if progress is not made to comply.

1.3.1. Effluent Storage

The importance of having a reliable contingency plan for use during adverse climatic conditions or system failure, as required by the MSRMP, has been regularly discussed with dairy farmers during inspections and through post inspection correspondence. It is a recurring issue between surveys that the effluent storage is often compromised due to ponds being full, solids build-up and/or vegetation not being removed. Effluent storage needs to be of suitable size and well managed to ensure that it can act as a reliable contingency to avoid spreading effluent to land when soils are saturated. Dairy effluent can be a valuable asset when utilised by spreading to land in suitable soil conditions.



Effluent pond is full with vegetation and solids build-up



Effluent pond has plenty of free-board available

The current plan rules do not outline how much storage is required or the standard of the storage system. There are many variables to be considered when calculating how much effluent storage is needed including herd size, rainfall and wash-down methods, however the pond calculator method is widely used as a tool to measure this.

Two farms have upgraded the effluent storage systems on their property to provide a reliable storage system operating at best practice. This has meant that two farms previously rated as significantly non-compliant (for pond location and lack of storage) have become compliant and have systems which meet best practice guidelines.

1.3.2. Application to land

Dairy shed effluent provides fertiliser savings and improved pasture production for dairy farmers when efficiently applied to land as it contains nitrogen (N), phosphorus (P) and potassium (K). Dairy effluent also contains high levels of organic matter, which can improve soil condition. Any potentially negative environmental effects are limited if dairy shed effluent is efficiently applied to appropriate land when conditions are suitable as required by the relevant plan rule, resource consent conditions and advised through best practice guidelines.

Throughout the 56 farms inspected, farmers use a range of effluent application methods including K-line pods, irrigation lines, travelling irrigators and effluent carts.



The most common types of effluent disposal in Marlborough from left to right; k-line pods, travelling irrigator and spreader truck

The MSRMP permitted activity rules and the resource consent conditions for individual dairy effluent discharges are designed to ensure that environmental effects are less than minor, as required by the Resource Management Act 1991. In order to effectively discharge effluent to land, some simple methods that farmers need to have include;

- a large enough disposal area for their dairy operation (a recommendation of 5ha/100cows minimum has been made for Marlborough),
- low application rates and
- suitable storage to prevent discharge during adverse weather and soil conditions.

The application of dairy shed effluent to land requires close management; some systems are more labour intensive than others and some are more efficient.

When dairy effluent is over-applied and allowed to cause ponding in paddocks, the soil water holding capacity is exceeded beyond field capacity and a moist nutrient rich environment is created which may allow faecal bacteria to grow. Pasture production can be hindered as the root zone can no longer utilise the effluent as soil saturation may result in dairy effluent moving below the root zone where it can potentially reach and contaminate groundwater and eventually impact of surface waterbody water quality.

Non-compliance with dairy effluent plan rules and consent conditions can cause significant adverse environmental effects and must be dealt with appropriately and subject to the severity of non-compliance.

The incidence of ponding has significantly reduced from previous surveys. This is an indication of better education and improved management practices for applying effluent to land in an efficient manner.

1.4. Summary of Compliance Ratings 2012/13 – 2015/16

Compliance Rating	2012/2013 Percentage	2013/2014 Percentage	2014/2015 Percentage	2014/2015 Follow up Percentage	2015/2016 Percentage	2015/2016 Follow up Percentage
Full Compliance	84%	80%	70%	77%	73%	91%
Technical Non-compliance	N/A	N/A	N/A	N/A	2%	0%
Non-Compliance	14%	18%	16%	9%	7%	0%
Significant Non-Compliance	2%	2%	14 %	To be determined	18%	9%

The table above shows the compliance ratings for the 2015/16 dairy effluent season compared with the three previous survey results.

The total non-compliance at the initial inspection was 27% however it is positive to note that this has reduced to only 9% after follow up site inspections or information was provided to Council to demonstrate compliance.

Technical and non-compliance ratings are generally a result of issues that can be quickly remediated by the farmer, this is reflected in the follow up inspection being at 0% (n.b. for national auditing purposes both categories are reported together as 'non-compliance' category).

It is interesting to note that the percentage of farms operating under the MSRMP permitted activity status that were non-compliant or significant non-compliant following the first inspection was approximately 32% while the percentage of those that were non-compliant or significant non-compliant against their resource consent was approximately 19%. This is consistent with the previous survey. All farms which continue to be significantly non-compliant are located in the Marlborough Sounds therefore they are non-compliant with the MSRMP.

The non-compliance issues can also be analysed between areas. In the Linkwater area, all farms were compliant at the initial inspection while the Opouri Valley had the highest rate of non-compliance.

Most Marlborough dairy farmers that have issues causing a non-compliance rating for their effluent system are proactive in making the required changes to become compliant as soon as possible.

Council is actively addressing the significant non-compliance through follow up visits and correspondence with the dairy farmers particularly during the dry season when time allows for farm maintenance.

Dairy Effluent issues to note from the 2015/2016 dairy survey-

- Insufficient 'freeboard' remaining in effluent storage systems.
- Those dairy effluent systems rated as non-compliant (orange) was as a result of a lack of a contingency plan or ponding occurring at the time of the inspection.

- Ongoing issues that were highlighted to many farmers in the 2014/15 survey have continued to occur in this survey. Those that had been rated as non-compliant (orange) in 2015/16 and have not made any changes to the effluent system and/or management have been rated significant non-compliant to reflect this
- The application of effluent within 20m of the nearest waterway was an issue on a number of properties.
- Enforcement action undertaken as a result of non-compliance includes four formal warnings and one infringement notice. All farms which received enforcement action undertook necessary changes to become compliant.

There are currently very few dairy farms in Marlborough that have dairyshed effluent systems that meet current industry best practice standards. While some have proactively invested in upgrades over time, many dairy farmers are reluctant to voluntarily make changes to their current effluent collection, containment and application systems. It also appears that some dairy farms have had very little change to the dairyshed effluent system since the survey began in 1994 while environmental standards and best practice have continued to move forward. It is envisioned that the upcoming plan notification outlining the new permitted activity rules for dairy shed effluent may drive those farms that have not yet upgraded the dairy effluent system to do so. It is important to note that many farmers are currently postponing planned effluent system upgrades until they know the new plan rules and due to the current low pay out.

Progress seen during the 2015/16 dairy survey –

- Two farmers have installed an above ground effluent collection and storage tank to become compliant and operate at best practice.
- One farmer has diverted a small waterway away from their dairy shed and effluent system.
- Several farmers have indicated that changes and upgrades to their systems will be taking place once the new dairy effluent rules have been notified and have engaged Fonterra's Sustainable Dairying Advisor for direction.

Council and the dairy industry are continually working with dairy farmers in Marlborough to progress dairyshed effluent infrastructure and management of the system to best practice standards. This is to achieve environmental standards that reduce risk of farm pollutants adversely affecting waterways and coastal areas in Marlborough. A dairy working group meets approximately two times per year to discuss regional issues and improvements.

1.5. Stream Crossings 2015/2016

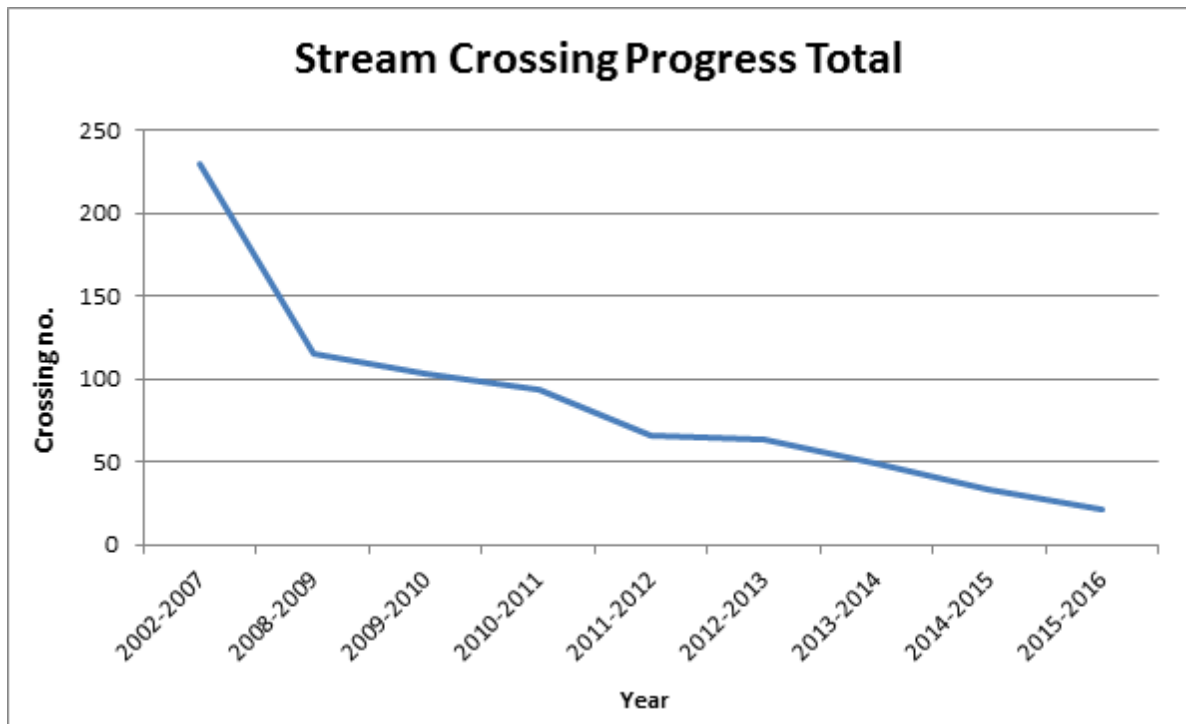
A stream crossing survey is completed in conjunction with annual dairy effluent survey. The purpose of the stream crossing survey is to improve water quality in Marlborough's waterways and to achieve this Council required the elimination of all places where cows walk through waterways. The stream crossing survey was first established in 2002 which identified crossing locations on all operating dairy farms in Marlborough.

During the effluent inspection, any remaining known stream crossings are checked to see if they are still in use. Crossings are eliminated through the installation of bridges and culverts or by altering access routes and raceways. The findings of the original stream crossing survey and the progress that the farmers have made to install culverts or bridges, is included in **Appendix C**. The total number of stream crossings has significantly reduced in the Marlborough Region since 2002 from 229 to 21 in 2016. It was initially envisioned that all stream crossings would have been eliminated and fencing completed by the end of December 2013. Council has proactively helped farmers to eliminate stream crossings by offering

free resource consents for the installation of culverts and bridges until December 2013 which aligned with the prospective date for total elimination and requirements of the 'Clean Streams Accord'.

The dairy industry is active in regards to initiatives to remove stock crossings through waterways. Both DairyNZ and Fonterra promote elimination of stream crossings and provide assistance as to how this can be achieved as part of the 'Sustainable Dairying: Water Accord'.

The remaining 21 stream crossings are on 7 farms (1 of which has 10 crossings not eliminated), all remaining stream crossings were initially rated low-priority. The remaining stream crossings have been highlighted to the farmers concerned and plans for elimination have been put in place to be followed up.



Appendix C Shows the stream crossing sites in Marlborough from the first survey until the 2015/16 dairy season.

2. Conclusion

In 2015/16 Council undertook site inspections at all 56 dairy farms in Marlborough. The purpose of the inspections was to check compliance with the permitted activity standards of the MSRMP or the dairy effluent discharge resource consents.

Overall improvement in the compliance rating is noted; in 2014/2015 the 'follow-up' full compliance was 77% this has improved to 91% 'follow-up' full compliance in the 2015/2016 inspection year.

This survey has highlighted the number of farms which have remained non-compliant between seasons or have been rated non-compliant for the same issue. All "non-compliance" rated farms have been remediated as required however some farms rated "significant non-compliance" have not yet completed work required to become compliant. The ongoing "significant non-compliance" will likely require infrastructural investment in order to become compliant.

Farms which were rated as "non-compliance" (orange) lacked a reliable contingency plan due to the effluent storage being full while one farm had ponding occurring, both issues required immediate remediation. Issues causing "significant non-compliance" (red) included spreading of effluent within 20m of a waterway and collection/containment systems located within 20m.

The remaining stream crossings are slowly being eliminated by those farmers which still walk stock through waterways. All remaining stream crossings are 'low priority' however the goal was to have these eliminated by December 2013. All farmers with remaining operating stream crossings have timeframes in place to eliminate these crossing sites.

Progress to improve effluent collection and containment systems is continuing to occur slowly, with two farms completing a full upgrade of their effluent systems this season. It is envisioned that this will increase in momentum when Council's requirements for dairy effluent systems are clarified through the public notification of the new plan rules.

Council continues to monitor dairy effluent operations to current plan standards or conditions of consent as applicable with a focus on resolving breaches through a graduated response process.

Appendix A – Example

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 NEW ZEALAND 7496
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**MARLBOROUGH
DISTRICT COUNCIL**

IC Cows – 13/1/1/-

Inspection:	03/02/2016 00:00a.m.
Plan:	MSRMP – Plan Rules
Number of Cows:	175
Disposal Area:	7 hectares
Method of Irrigation:	Travelling Irrigator



Dairy Plan Rules Assessment - Rule 36.1.7.3

(a)	The discharge shall not be within 20 metres of a surface water body or over any unconfined aquifer; <i>Discharge had been applied to land within 20 metres of a water body. The travelling irrigator unit was positioned too close to a waterway.</i>	
(b)	There shall be no run-off of contaminants into surface water resulting from the discharge of the contaminant onto or into land; <i>No run-off noted on the site inspection. The travelling irrigator was within 20 metres of a waterway, however there was no run off into this waterway.</i>	
(c)	The total nitrogen loading on the area to be used for discharging shall not exceed 200 kg N/ha/yr; <i>The effluent from 160 cows is spread over 7 hectares. During this site visit effluent application to land by irrigator had caused minor ponding to occur.</i>	
(d)	When discharging effluent a buffer zone of a minimum 10 metres in width is to be maintained between the area of discharge and any property boundary; <i>No discharge within 10 metres of property boundaries.</i>	
(e)	The wash water collection, containment and application system shall not be within 20 metres of the boundary of any neighbouring property without that person's prior written consent, a copy of which shall be forwarded to the Marlborough District Council; <i>The washwater collection, containment and application system is more than 20 metres from the boundary of the neighbouring property including the road.</i>	
(f)	The wash water collection and containment system shall not be within 20 metres of any surface water body; <i>The collection sump is located within 20m of the nearest waterbody. Although the storage pond is now located more than 20m from the nearest waterbody, there are concerns that environmental effects would be more than minor if the sump was to overflow in this location.</i>	
(g)	The wash water collection, containment and application system shall not be within 20 metres of any area identified by Tangata Whenua as being of special value, or any filed archaeological site; <i>Tangata Whenua and archaeological sites were discussed with the farmer who advised that there are no special value sites on the farm.</i>	
(h)	There shall be no spray drift beyond the boundary of the land to which the effluent is discharged; <i>No spray drift noted on the site inspection.</i>	

(i)	No objectionable odours shall be able to be detected at or beyond the legal boundary of the land to which the effluent is discharged; <i>No objectionable odour noted on the site inspection.</i>	
(j)	There shall be contingency measures in place to ensure that there is no contravention of the above conditions in the event of system failure or adverse climatic conditions; <i>One pond for contingency measures estimated total capacity 20m³</i>	
Stream Crossing		
Stream Crossings:	Surveyed 2003	
Survey Found:	7 sites where cows walk through waterways.	
Current Situation:	1 bridge and 4 culverts installed. There are 2 low priority crossings remaining. These crossings and fencing of waterways should have been eliminated by 1 December 2013. The farmer is to eliminate these crossing during the dry period.	
Overall Comment	There are still two remaining stream crossings. It appears that effluent has overflowed into the nearby old pond area from the stone trap. The travelling irrigator was located within 20m of the nearby waterway and was discharging effluent in non-compliance with rule (a).	
Action Required to be Undertaken	<ul style="list-style-type: none"> Prevent effluent from being discharged through the overflow pipe in the collection sump immediately. Efficiently spread effluent to receiving land that has recently been grazed so that nutrients are taken up by the soil. Care needs to be taken to prevent thick applications and ponding occurring. Care also needs to be taken to discharge to land well away from nearby waterways. Thought needs to be given to more efficient or low application ways of discharging effluent to land. Bund the bridge located beside the cowshed to prevent effluent discharging into the waterway immediately. Seek compliance for the location of the sump collection area or look for alternative options 	

Appendix B

A Compliance approach on each farm visit:

Pre inspection letters were sent to all farmers in August 2015 to advise farmers that the survey was about to commence and to highlight areas of particular concern that Council will be looking at. The letter also informed Dairy Farmers that Council had adopted the national dairy auditing guideline which recommends cold calling instead of booking appointments. If the farmer was concerned about this, they could contact Council. A programme of two days a week in the field is used, leaving three days for preparation of inspection and completing file notes and follow up compliance reports and post inspection letters.

- Equipment consists of camera and GPS, Council vehicle with the water sampling kit, paper work with site inspection form for general notes, report card form (listing permitted activities or resource consent conditions), post inspection letter and stream crossing forms in case any remaining sites where cows walk through waterways have been eliminated.
- Review previous year's inspection results to check history and compliance rating in previous seasons.
- During the site visit stone traps, sumps and effluent ponds are inspected and photographed. All solid and liquid waste from the washwater collection and containment systems must be contained within the system or are being irrigated in accordance with the plan rules or resource consent. Walk over the most recently irrigated part of the disposal field.
- If stream crossings have not been recorded as eliminated, these are checked for progress.
- Following inspections, farmer's inspection sheets, report cards, post inspection letters and stream crossing updates are completed.

- All farmers receive a post inspection letter and their report card indicating the compliance rating of their farm.

Please note: In terms of the national standards the compliance rating is only from the washwater collection and containment system. If there is a discharge from other sources (i.e. Cow crossing on roads, silage pit leachate) then these must be assessed and controlled but in terms of recording compliance for dairy effluent audit they do not affect the rating of the farm.

Detected Non-Compliance during Inspection

If any non-compliance is detected, investigation and follow up action is taken as required.

If the non-compliance issue can be fixed, the farmer is asked to fix it straight away, for example, if there was overloading of effluent to the disposal field the farmer needs to turn off the discharge or move the effluent dispersal equipment.

If the farmer requires time to resolve the non-compliance issue, a follow up inspection may be required.

Any significant non-compliance is actively addressed with the dairy farmer, if this is not possible then further enforcement action can be undertaken.

Note: that compliance is rated from only what was noted on the site inspection, Council can only say that the farm complied or did not comply at the time and date that the inspection was undertaken. Council staff also rely on information the farmer provides.



Compliant



Non- Compliant

Appendix C

The table below shows the stream crossing sites in Marlborough from the first survey to the 2015/2016 dairy season. On the initial survey Council categorised the crossings into high and low priorities. The crossings sites were prioritised by frequency of use, number of cows, size and type of waterway and whether the waterway was permanent or ephemeral.

Stream Crossings in Marlborough

Stream Crossings (SC) at First Stream Crossings Survey 2002 to 2007				
	Number of Farms with SC	Number of High Priority SC	Number of Low Priority SC	Total Crossings
Rai Valley	27	43	69	112
Pelorus	12	12	25	37
Tuamarina	9	15	29	44
Linkwater	7	12	5	17
Havelock	7	9	5	14
Wider Marlborough	9	2	3	5
Total	71	93	136	229
Stream Crossings (SC) at 2013/14 Dairy Season				
	Farms with SC	High Priority SC	Low Priority SC	Total
Rai Valley	6	1	20	21
Pelorus	2	0	3	3
Tuamarina	4	0	11	11
Linkwater	3	1	2	3
Havelock	1	0	2	2
Wider Marlborough	2	2	7	9
Total	18	4	45	49
Stream Crossings (SC) at 2014/15 Dairy Season				
	Farms with SC	High Priority SC	Low Priority SC	Total
Rai Valley	5	1	16	17
Pelorus	1	0	2	2
Tuamarina	4	0	11	11
Linkwater	0	0	0	0
Havelock	1	0	1	1
Wider Marlborough	2	1	2	3
Total	18	2	32	34

Stream Crossings (SC) at 2015/16 Dairy Season				
	Farms with SC	High Priority SC	Low Priority SC	Total
Rai Valley	3	0	13	13
Pelorus	1	0	2	2
Tuamarina	2	0	3	3
Linkwater	0	0	0	0
Havelock	1	0	1	1
Wider Marlborough	1	0	2	2
Total	8	0	21	21