

Farm dairy effluent discharge regulation in the Otago Region

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ABSTRACT

The Otago Regional Council (Council) promotes land based discharges, hence the Regional Plan: Water for Otago (Water Plan) allows farm dairy effluent irrigation as a permitted activity. Consents for farm dairy effluent discharges to water have been discouraged strongly by Council since 2001. Consequently, currently all farm dairy effluent discharges are to land and there are no farm dairy effluent discharges to water in the Otago Region. For many years Council adopted an educative and monitoring approach to compliance with its effluent permitted activity rules. Since regular compliance monitoring commenced a majority of the farms (85-90%) have been compliant. However, there had been ongoing and significant non-compliance from a small proportion of the farms. To improve this situation Council has introduced an infringement regime since 2003. After finding poor progress with the infringement regime Council introduced a prosecution regime in 2007. There has been a substantial improvement in compliance in 2009. At this stage it is difficult to attribute the improved compliance solely to Council's legal actions. Council will continue to use its educative approach despite an ongoing stringent enforcement regime.

INTRODUCTION

Currently there are 385 dairy farms in the Otago Region (Figure 1). Much of the dairying is confined to South, South West and North Otago. Compared to many of the major dairying regions (e.g. Waikato and Taranaki) the number of dairy farms in the Otago Region is low. However, judging by the past dairy conversions there is a potential for more dairy conversions in the Otago Region. Even at the rate of 20 to 40 conversions per year in the next two decades the total number of dairy farms in the Otago Region is likely to remain well below that of the major dairying regions in New Zealand.



Figure 1. Map of Otago Region

Most historic dairy conversions have been confined to South and South West Otago because soil moisture is not a key limiting factor and intensive pasture production in these areas could sustain good milk production. However, there has also been a trend in dairy conversions in other areas such as North Otago, Maniototo and the Manuherikia Catchment. Between 2000 and 2004 there had been an estimated 40-50 dairy conversions mainly in the South and South West Otago. In the past five years there have been 35 dairy conversions in the Otago Region. Apart from economical factors the major factor influencing conversions in dry areas has been ease of access to irrigation water through either irrigation schemes (e.g. North Otago Irrigation Company Ltd scheme with a command area of 10,000 ha) or individual water rights. Provided the current and favourable economical trend for milk products and the increasing interests in irrigation schemes in the Clutha River continue, the predicted dairy conversion rate could be greater.

The current and relatively low number of dairy farms in the region provides Council an ideal opportunity to manage any adverse environmental effects arising from dairying. The adverse effects could be from poor management of farm dairy effluent and pollutions from non-point sources of wider dairying activities. Farm dairy effluent activities are controlled by existing rules in the Water Plan whilst the issues of non-point sources are being considered by Council in view of introducing new rules in the Water Plan. Farm dairy effluent irrigation is a permitted activity outside the Groundwater Protection Zones (GPZ) with the exception of Waitaki Plains GPZ. Consents are required for any treated farm dairy effluent discharge to water. This paper reviews compliance issues and the management of the compliance issues related to the permitted activity of the farm dairy effluent in the past decade.

DISCUSSION

Compliance monitoring

Annual dairy farm inspections have been performed by warranted officers of Council to monitor farm dairy effluent discharge compliance. Until 2005 farm inspections were performed between November and May. In the past three years inspections were completed between September and November. Since consents to discharge to water had been phased out by mid 2000 the primary purpose of the annual dairy inspections have been to monitor compliance with the permitted activity rules. The following key requirements in the permitted activity rules were assessed during each inspection:

- The location of the effluent irrigation sites in relation to bores or waterways;
- Soil moisture status (i.e. whether saturated or not);
- Any runoff or direct discharges to waterways, water race, drains;
- Ponding of effluent; and
- Area available for irrigation and cow numbers.

In addition the followings were also assessed:

- Storage capacity;
- Effluent overspills from storage;
- Effluent discharge from tile & mole drain pipes to waterways or drains;
- Type of irrigation; and
- Feed pads effluent management.

In early 2000, annual inspections of dairy farms were given prior notice before inspection. Despite this there were ongoing non-compliances. From 2005 onwards no prior warnings were given to farms. In the past three years a letter has been sent to all farms well before the milking season advising dairy farmers to adopt best practice methods for effluent irrigation and to comply with the permitted activity rules. It was also informed that inspection work would occur in the beginning of the season when soil conditions are usually wet. A summary of previous year's enforcement action was also provided in the letter along with a statement that a similar approach would be taken in the new milking season. Enclosed with the letter were also the effluent management and best practice options booklets.

When significant non-compliance was found a request was made to the farmers to improve effluent management and a follow-up visit was made after a week to check compliance. Significant (e.g. discharge to water or major ponding) and minor non-

compliances (e.g. minor ponding) have been recorded or monitored by warranted officers using very simple tools such as photos. In cases where effluent was discharged to waterways, along with discharge samples, water samples had been taken upstream and downstream.

Significant and minor non-compliances are investigated by the warranted officers and all interviews are recorded in writing and signed by the officer and the offender or the witness. Once the investigations are completed a report is submitted to the Council's Enforcement Decision Group (EDG) which comprises of the Chief Executive, Director Resource Management and Compliance Manager. Any two members of the EDG could authorise the serving of infringement notices and the Chief Executive has been delegated to initiate prosecutions. There is no Council interference to enforcement actions taken by staff. All enforcement actions are reported to the Compliance Committee of the Council on a regular basis. All councillors have membership with the Compliance Committee. Councillors' or the Committee's feedback generally provides support to staff actions. It is Council policy not to reveal the identity of the offending farms or farmers either to Committees or media. This is because Council is satisfied that legal actions are sufficient punitive measures and 'naming and shaming' is additional and unnecessary.

Farmer education

The Council's Land Resources section co-ordinates and manages farmer education on effluent and education on other environmental issues. Land Resources staff visit farms during or prior to dairy conversions and provide appropriate advice on effluent and riparian management. Educational materials (small B4 size booklets) such as '*Environmental considerations for dairy farming in Otago*', '*Environmental considerations for managing dairy effluent application to land in Otago*' and '*Environmental considerations for clean streams – A guide to managing waterways in Otago*' are sent or given to every farm in the region. Regular field days are held on effluent, stream and water efficiency management. The education on effluent emphasises the significance of deferred irrigation, waste water minimisation, stormwater diversion from storage systems, low effluent application rates and tile and mole drained area management.

Non-compliance

Since early 2000 the trend in effluent compliance in the region has been consistent and between 85 and 90%. The non-complying farms are graded on the basis of significant and minor adverse effects. The following issues were found commonly on non-complying farms:

- Lack of effluent storage or overspill of storage;
- Irrigating on saturated soils;
- Use of travelling irrigators or excessive irrigation on tile & mole areas leading to discharges to waterways;
- Extensive ponding of effluent;
- Runoff of effluent to waterways; and
- Mechanical failure (pipe or travelling irrigator breakages) leading to effluent flow.

Effluent storage

There is no rule requirement on effluent storage hence many farms ignored the significance of adequate effluent storage capacity. Many farms irrigated effluent from effluent sumps. Such an approach could be taken in relatively dry areas such as North Otago with some risks, however, in wet areas such as South or South West Otago sufficient storage is essential. It was found that in wet parts of the Otago Region there was a strong link between non-compliance and lack of effluent storage. On wet days or when the soils were saturated, farms with lack of or no storage continued to irrigate effluent. There has been a trend of ponding, effluent runoff and overspill of sumps attributed to lack of storage. In the 2008/09 season staff found 52 farms with lack of or insufficient storage facility. In many cases stormwater from the farm dairy roof or yard has been found to be diverted to the storage or pond systems.

Travelling irrigation system

In New Zealand travelling irrigation systems have been the popular choice of effluent irrigation systems on dairy farms. Typically, the effluent application rate of a travelling irrigator is in excess of 25 mm/hour (25-75 mm/hour). This rate is very high for heavy or tile and mole drained soils. Many farms in South and South West Otago (and in Southland) have been tile and mole drained to provide sufficient drainage. Such farms were converted from sheep farms. Without providing this degree of drainage neither sheep nor dairy farming is possible on these soils. Tiles or mole pipes are laid at 30-40 cm depth or close to hardpan (fragipan) of the soil profile. The outlets of the tile and mole drainage pipes are typically connected to waterways or drains. Unfortunately, in many cases no records (i.e. maps) on tile and mole drained areas have been maintained nor conveyed from one owner of the farm to the other. Extra care on effluent irrigation is required in tile and mole drained areas, hence without knowing the location of the tile and mole drained areas selective irrigation is not possible. Fortunately it has been realised that once the effluent solids are settled other slow rate irrigation systems such as K-line could be used successfully in tile and mole drained areas. K-line could provide the desired 5 mm/hour application rate avoiding any effluent by-passing topsoil and reaching tiles or moles.

Lack of farmer interest in effluent management

Apart from the correct choice of irrigation system and adequate storage, the main factor contributed to non-compliance of the permitted activity rules was lack of farmer interest in effluent irrigation. Despite the high nutritive value (excessive amounts of potassium and high N levels) effluent has been considered as a waste product by the non-complying farmers hence 'effluent disposal' appeared to be the concept. In such cases securing the correct irrigation system or adequate storage had little or no impact on non-compliance. Typically in such cases the well constructed and large storage systems were managed with little or no freeboard indicating a lack of interest in emptying ponds or storage systems during favourable weather and soil conditions or during the preceding non-milking period. As an example, when staff revisited one such farm on a warm and dry summer day the storage system was full with a large amount of crust on top and the irrigation system was on idle. Given the preceding weeks were also dry and the fact that the farmer was issued with an infringement notice for effluent overspill several days before, the revisit was disappointing. On the same day staff were pleased to note a neighbouring farm irrigating effluent with both storage ponds being half empty without any crust. When speaking to the farmer the response was that the effluent irrigation was included in the overall farm management system.

ORC responses to non-compliance

The Council took a step by step approach to ongoing non-compliance. Realising the significant amount of ORC staff time and resources spent on education in the previous decade and the ongoing non-compliance, Council introduced a 'three strikes' infringement regime in early 2000. When no progress was made a 'no strike' infringement regime was introduced during 2003/04 milking season. A large number of infringement notices (each \$750 as set in the Resource Management Act Regulations) were issued during this season. The following season showed a significant improvement in offending (Table 1).

The good compliance trend continued until the 2006/07 milking season. However, a large number of non-compliances were reported during the beginning of the 2007/08 dairy inspection. The non-compliances were very serious resulting in discharges to waterways and major effluent pondings. All serious breaches resulted in prosecutions (24 prosecutions) and minor breaches received infringement notices (18 infringements). All prosecutions and infringement notices were successful. The prosecution fines varied, depending on the judges and the severity of the cases, from \$4,000 to \$37,150. A majority of the prosecutions (18) were from wet parts of Otago (Clutha District) whilst four from North Otago and two from Dunedin. Whilst prosecutions were being heard, Land Resources staff visited many of the non-complying farms to advise on effluent management. There were field days held in several locations to improve compliance.

Table 1. Enforcement Actions Since 2003

Year	Infringements	Prosecutions
2002/03	1	
2003/04	22	
2004/05	6	1
2005/06	3	
2006/07	4	
2007/08	18	24
2008/09	3	21
2009/10	2	5
Total	59	51

It is difficult to explain the reasons for the large number of serious breaches in the 2007/08 season. Farmers attributed non-compliance to unusual wet conditions. Monthly rainfall records for 2007 for the South and South West Otago indicate that the October rainfall was greater than in the preceding and proceeding three years. Most inspections were held during this month. A majority of the breaches were related to ponding or runoff of effluent caused by poor use or mechanical breakdown of the travelling irrigators. In many cases the indirect cause of the breaches was lack of effluent storage which resulted in farmers irrigating effluent during wet conditions or onto saturated soils. One of the judges who heard these cases emphasised that farms could not comply with the ORC permitted activity conditions without sufficient storage. Whilst higher rainfalls could cause poor conditions for effluent irrigation, sufficient storage (three months) could avoid situations such as irrigating effluent onto saturated soils. It is noteworthy that the August, September and November 2007 rainfalls for the South and South West Otago were below average. If the farms had three months storage and sufficient freeboard they would not have been 'forced' effluent irrigation during the unusually wet October month.

In the following year (2008/09) whilst there had been a significant decline in minor non-compliances resulting in only three infringement notices, the number of significant breaches did not drop significantly. Whilst there were 21 prosecutions, 18 were offending farms with repeat offences during reinspections. Among the farms prosecuted, one was also prosecuted in the 2007/08 season. Council expected good compliance for the 2008/09 season because of its stringent actions in the previous season. The continuing trend of significant non-compliance was disappointing for Council and difficult to explain.

Fortunately during the current milking season the non-compliance has improved substantially with only two infringement offences and five prosecutions. It is noteworthy that there have been no prosecutions in the South or South West Otago during the current milking season. Four of the five prosecutions are from the North Otago area. It is hoped that this good trend of low number of prosecutions and the good compliance in the Clutha District will continue in the future.

Response from farmers and the industry

It must be emphasised that judging by overall compliance a majority of the farmers maintain an excellent compliance record with Council. Council focus has been on the ongoing non-compliances by a small proportion of non-complying farms. When the infringement regime was introduced in 2003, in the following years there was a substantial reduction in non-compliance. As stated before the large number of non-compliances found in 2007 and 2008 was surprising to Council and a majority of the farmers. There was a significant media interest in the prosecutions and the responses from individual farmers to media were:

- Council should work with farmers rather than prosecuting;
- The offences were not significant to warrant prosecutions; and
- Unusually wet season caused effluent problems.

Most non-complying farmers pleaded guilty which made the court hearings short and straight forward. There were concerns expressed by prosecuted farmers that the RMA convictions were similar to criminal convictions and that these would stay on their records.

On the other hand, several farmer group leaders and some farmers criticised ongoing non-compliances and poor effluent management practices and supported Council's actions. Council discussion with Fonterra indicated that Fonterra did not support non-compliance since this was identified as one of the five targets in the Clean Stream Accord signed by regional councils, MfE, MAF and Fonterra. Fonterra also offered to advise farmers of good practice in effluent management.

Response from other parties

There was wider community support to Council's actions reflected from letters to the local newspaper, editorial of the local newspaper and councillor feedbacks. Organisations such as Fish & Game also welcomed Council's actions although there was a suggestion of converting effluent irrigation from permitted activity to consented activity. The presumption was that consented activities yield better compliance outcomes. Council is not comfortable with adopting a philosophy of prescribing detailed effluent irrigation regime on a farm by farm basis through consenting process.

Effluent irrigation can be managed in a number of ways to ensure no ponding or runoff or discharge to waterways. The existing and simple permitted activity rules provide farmers the freedom of choice of technology and methods to obtain full benefits derived from effluent irrigation. If permitted activity rules are monitored annually or regularly without any prior notification to farmers, such a process is likely to provide a similar outcome to that of regularly monitored discharge consents.

CONCLUSIONS

It is disappointing that a small proportion of the dairy farms in the Otago Region have been non-compliant with the effluent irrigation permitted activity rules. The underlying issue is lack of uptake among the non-complying farms that farm dairy effluent is a valuable resource. Such an attitude might have resulted in issues such as lack of storage, diversion of stormwater into storage, poor choice and maintenance of the irrigation system, excessive irrigation and irrigation during wet conditions. Council's long-term educative approach coupled with the step-by-step regulatory approach on effluent discharge helped send a clear message to non-complying farmers that education has its limitations on farmers with poor uptake of information and that non-compliance is no longer tolerated by Council. Both the infringement notice and prosecution regimes introduced by Council appeared to have resulted in improved compliance. Few more years of monitoring and adverse weather (wet) conditions during milking season will reveal the effectiveness of Council's actions. In the meantime, despite the continuing tough enforcement stance, Council will continue with its educative approach.

REFERENCES

- Environmental considerations for dairy farming in Otago. 2001. Otago Regional Council, Private Bag, Dunedin. pp 22.
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