

# **FINDING A BETTER WAY: A COLLABORATIVE APPROACH TO FARM DAIRY EFFLUENT MANAGEMENT**

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## **Summary**

The dairy and irrigation industries, along with AgResearch, are working with Environment Southland on a review of the Council's approach to farm dairy effluent management. The Southland region has experienced significant growth in the dairy industry over the last decade. Environment Southland's current regional plan for managing farm dairy effluent is over 10 years old and does not reflect advances in science and technology. Ad hoc responses to the growth in the dairy industry through consenting processes have resulted in a regime that has been criticised as being overly complex, difficult to comply with and inflexible. In response to concerns about the existing regime, Environment Southland has embarked on a review of the management of farm dairy effluent in collaboration with the dairy industry and AgResearch.

The aim of the collaborative process is to ensure a farm dairy effluent management regime that addresses environmental effects but is also practical and does not unnecessarily constrain dairy farmers' freedom to operate. Industry involvement early in the process is important to help find practical, workable solutions.

The new regime for farm dairy effluent is being developed using a risk based approach underpinned by a scientific report prepared by AgResearch, and peer reviewed by Lincoln University and Landcare Research. The report matches effluent management practices to different soil and landscape features. A technical working group comprising of Environment Southland staff, scientists and representatives from the dairy and irrigation industries have developed recommended new regional plan provisions for managing effluent based on the report, along with associated standard consent conditions and inspection/audit requirements. These recommendations are being consulted on in June 2010, with a series of farmer workshops run jointly by Environment Southland, DairyNZ, Fonterra and Federated Farmers.

The proposed changes to the Environment Southland approach means that requirements for effluent management will be based on science, risk and environmental effects. Farmers will be incentivised to use low risk soils and/or methods of applying effluent. A memorandum of

understanding between Environment Southland and the dairy and effluent systems industries will address concerns about consent conditions changing on a regular basis.

Environment Southland expects the new approach to prevent direct losses of contaminants to water and ensure valuable nutrients are kept in the root zone so they can be taken up by plants.

The work being done on farm dairy effluent is part of a wider project looking at all discharges to land including urban, industrial and rural discharges.

## **Background**

The Southland region has experienced significant growth in the dairy industry over the last decade. Environment Southland's current regional plan for managing farm dairy effluent is over 10 years old, based on cow numbers and does not reflect advances in science and technology. Following best management practice guidelines being adopted as defacto policy in 2007, consent conditions have become much broader and restrictive than pre-2007 consent conditions. This resulted in a regime criticised as being overly complex, difficult to comply with and inflexible. It has also been expensive as all effluent disposals have been treated as high risk with blanket 60 to 90 day storage requirements applied. Farmers have also had concerns about the fact the goal posts appear to be continually moving with consent conditions changing on a regular basis.

Given the above, representatives from the dairy and effluent system industries, AgResearch and Environment Southland spent two days in a workshop last year developing recommendations about future effluent management in Southland for consideration by Environment Southland's Council. The recommendations developed were underpinned by a report by AgResearch matching effluent management practices with soil and landscape features (AgResearch, 2009).

Environment Southland's Council subsequently supported in principle the proposed new approach to effluent management discussed at the workshop, and gave approval for a working group comprised of a subset of those present at the workshop to advance the development of new plan provisions, standard consent conditions and inspection/audit requirements. As a result of some of the concerns raised during the workshop and through the recent Long Term Council Community Plan process, the Council also made some immediate fixes to the standard consent conditions and inspection/audit activities. This paper outlines the background to the proposed new approach to effluent management developed by the working group and provides a summary of the approach.

## **Why do we need to manage effluent?**

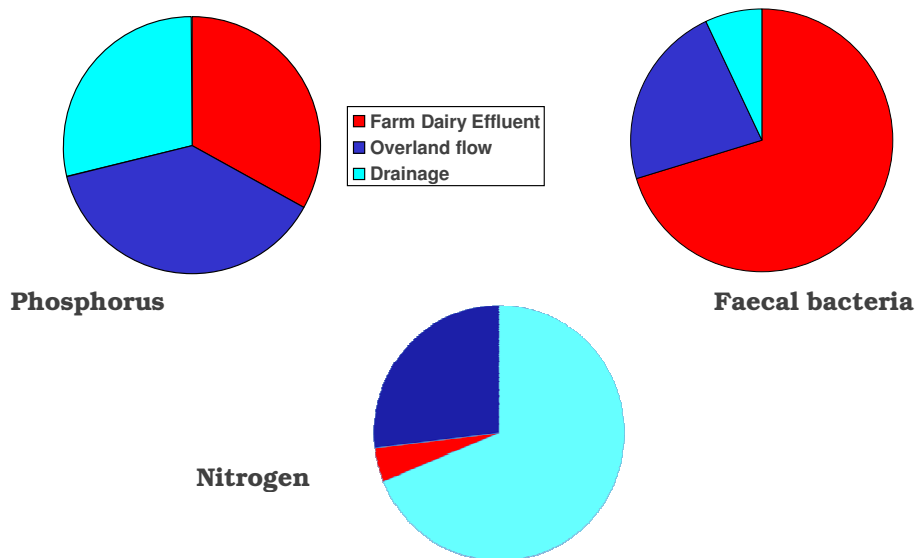
Environment Southland's role in effluent management is linked to the potential impacts of effluent on water quality. The top three water quality issues for Southland are:

1. faecal contamination of waterways reducing recreational, cultural and stock drinking water quality
2. excessive nutrients where they cause nuisance algae or loss of drinking water quality

3. sediment affecting fisheries and ecosystems.

AgResearch has found that the main impacts that effluent management can have on water quality is through losses of *E. coli* and phosphorus. As noted above, faecal contamination (which *E. coli* is an indicator of) affects recreational, cultural and stock drinking water quality, while the main risk associated with high levels of phosphorus is nuisance algae. The contribution of effluent in terms of contaminant losses from the milking platform is highlighted below:

**Figure 1. Sources of Nitrogen (N), Phosphorus (P) and *E. coli* discharges to water from a Southland dairy farm, AgResearch**



How should effluent be managed?

AgResearch (2009) recommends a risk based approach which matches effluent management practices with soil and landscape features in order to prevent direct losses of contaminants to water and ensure valuable nutrients are kept in the root zone so they can be taken up by plants. The following table shows the minimum criteria effluent management systems that must be met to achieve this:

**Table 1. Minimum criteria for land applied effluent management systems, AgResearch**

Soil and landscape feature	Artificial drainage or coarse soil structure	Impeded drainage or low infiltration rate	Sloping land (>7°)	Well drained flat land (<7°)	Other well drained but very stony <sup>x</sup> flat land (<7°)
Application depth (mm)	< SWD <sup>*</sup>	< SWD	< SWD	< 50% of WHC <sup>#</sup>	≤ 10 mm
Application rate (mm/hr)	N/A <sup>**</sup>	N/A <sup>**</sup>	< soil infiltration rate	N/A	N/A
Storage requirement	Apply only when SWD exists	Apply only when SWD exists	Apply only when SWD exists	24 hours drainage post saturation	24 hours drainage post saturation
Maximum N load	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr

\* SWD = soil water deficit,

# WHC = water holding capacity in the top 300 mm of soil,

<sup>x</sup> Very stony= soils with > 35% stone content in the top 200 mm of soil

\*\* N/A = Not an essential criteria, however level of risk and management is lowered if using low application rates

## Proposed new approach to effluent management

At the effluent workshop held in 2009, there was general agreement that the new approach to effluent management should:

- be based on the risk of adverse environmental effects;
- provide clarity and as much certainty as possible...BUT still allow flexibility;
- be practical to comply with ...AND still achieve environmental outcomes.

The proposed new approach to effluent management developed by the working group to achieve the above is outlined below.

### ***Step 1 – Environment Southland specifies what farmer has to get right in the regional plan***

The working group is proposing that the policies and rules in the regional plan be based on the AgResearch Report and require effluent to be applied in such a way that it stays in the root zone and is taken up by plants rather than being lost to waterways or groundwater. To give effect to the risk-based approach outlined in the AgResearch Report, it is proposed to link consenting and inspection/audit requirements to the level of risk associated with effluent irrigation as shown in the following table:

**Table 2: Effluent irrigation risk**

<p><b>Low risk</b></p> <ul style="list-style-type: none"><li>• Low rate effluent irrigation onto soils with artificial drainage, coarse soil structure, impeded drainage or low infiltration rates</li><li>• Low or high rate effluent irrigation onto well drained flat land</li></ul> <p><b>Medium risk</b></p> <ul style="list-style-type: none"><li>• High rate effluent irrigation onto soils with artificial drainage, coarse soil structure, impeded drainage or low infiltration rates</li><li>• Low rate effluent irrigation onto sloping land</li><li>• Effluent irrigation onto areas outside of the mapped soil/landscape classes</li></ul> <p><b>High risk</b></p> <ul style="list-style-type: none"><li>• High rate effluent irrigation onto sloping land</li></ul>
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To encourage farmers to move to effluent irrigation activities that are low risk, it is proposed to make these activities a controlled activity. This means that resource consent must be granted. A streamlined consent process for these activities is also proposed with no requirement for written approvals from neighbours, longer consent durations and reduced inspection/audit requirements.

## ***Step 2 – Farmer determines how to meet regional plan requirements***

In order to provide flexibility in meeting regional plan requirements, the working group is proposing three options for potential consent applicants:

4. adoption of a default set of consent conditions based on the soil/landscape class mapped within the regional plan for the effluent disposal area; or
5. refinement of the default set of consent conditions based on farm mapping of the soil/landscape classes within the effluent disposal area and/or a property specific calculation of storage requirements; or
6. property and effluent system specific consent conditions based on a plan supplied by the consent applicant containing detailed information on the effluent disposal area and proposed effluent system, demonstrating how the minimum criteria contained in Table 1 will be met.

In terms of (1) and (2), the working group has developed default consent conditions (i.e typical conditions that will be applied) for each soil/landscape class based on advice from AgResearch. To ensure clarity and certainty it is proposed that these conditions be made more accessible (e.g. available on Environment Southland’s website) and that a specific process be put in place for changing these default conditions that provides for a scientific review of the conditions and allows the dairy and effluent system industries to comment on the draft conditions before they are finalised. It is proposed to set up a Memorandum of Understanding (MOU) between Environment Southland and the dairy and effluent system industries to facilitate this.

In terms of (3), the plan (and potentially the system once it is installed) may need to be “certified” by a suitably qualified person that the minimum criteria contained in Table 1 will be met (potentially this could be someone accredited as an effluent system provider under the National Industry Design Standards and Code of Practice for Farm Dairy Effluent currently in development).

## ***Step 3 – Inspections/audits to check farmers are getting it right***

On-farm inspections/audits provide the check that the “what” is being achieved and involve checking of the “how” as well. The present inspection/audit framework for effluent discharges includes:

- on-farm inspections of the effluent management system
- water quality sampling (surface water or groundwater)
- helicopter inspections, and
- audits of the application rate of new effluent management systems.

It is proposed that a modified version of these inspections/audits continue to ensure that minimum requirements are being met. Potentially the type of inspection/audit and the frequency could be linked to the risk of adverse effects associated with the receiving environment (soil/landscape class) and/or the type of effluent system. For clarity and certainty, it is proposed that the inspection/audit

framework be made more accessible and a specific process for preparing and changing this framework be also instituted (perhaps in tandem with the process for default consent conditions outlined above).

## **What will change for dairy farmers?**

The proposed changes to the Environment Southland approach to effluent management mean that:

- what dairy farmers have to comply with will be based on science, risk and environmental effects.
- dairy farmers will be incentivised to use low risk soils and/or methods of applying effluent. The lower the risk (based on soil type, topography and irrigation method) the easier it will be to get consent. Consents for low risk effluent application will go through a streamlined consenting process with no affected party approvals and the consent term will be for longer.
- consent conditions will be able to be tailored to individual properties based on science and farmers will not be required to have more storage than they need.
- there will be a Memorandum of Understanding (MOU) between Environment Southland and the dairy and effluent system industries. This will address concerns about the goal posts being moved with consent conditions changing on a regular basis.

## **Where to from here?**

Feedback is currently being sought on the proposed new approach to effluent management to assist Environment Southland's Council to decide whether or not to proceed with the new approach and determine the final form of any new approach that is adopted.

## **References**

Houlbrooke D J, Monaghan R M. 2009. The influence of soil drainage characteristics on contaminant leakage risk associated with the land application of farm dairy effluent. Report prepared by AgResearch for Environment Southland.