

5.10 POND PERFORMANCE CONSIDERATIONS

5.10.1 Drainage control and leak detection systems

Piping failure (erosion along lines of weakness) in soils underlying ponds should not be an issue with a properly constructed and maintained FDE pond where leakage is very low. If foundation soils are dispersive, or otherwise prone to piping and formation of sub-soil cavities (tomos), specific underdrainage provision may be prudent.

An FDE pond would not normally be designed with secondary lining and leak detection systems; however, RCs are increasingly encouraging these features in pond design. Foundation soils will generally be orders of magnitude more permeable than the pond liner. Small leakages will dissipate to the soil. If underlying soils are slowly permeable (for example, $<1 \times 10^{-6}$ m/s), then an underdrainage system (gravel layer or strip drain) could be incorporated.

Whilst it is recommended that the highest water table level for a site be below the base level of the pond, this is not always achievable. In this situation, liner and pressure release design is particularly important.

Water drainage and water table management can be via trenches. Generally, these are either permeable material wrapped with a geotextile or perforated drainage pipe wrapped with a geotextile to avoid finer particles entering. Drains should be placed approximately 5 m apart, in addition to being positioned around the foot of the base perimeter. For smaller ponds a ring drain placed at the foot of the batter slope should be suffice. To further aid drainage, allow for 100 mm of drainage metal over the drainage system.

The water drainage network should culminate in an inspection point; this allows the collected liquid to be tested and liner leakage to be ruled out.

A Leak Detection System (LDS) installed at the time of pond construction will provide a very convenient means of providing ongoing leakage detection. These systems consist of a water drainage network (aggregate or piping with impermeable base layer) underneath any clay or synthetic liner, which drain to an inspection well. Liquid in the well can be easily inspected, collected, and, if necessary, tested to determine the source; groundwater will tend to be low in nutrients, solids, and bacteria, whereas FDE will be high in all three.

The well itself should be 400 mm or greater in diameter, for example, formed from a length of culvert pipe and able to be easily sampled from (using a suction pump or grab system). Further, the inspection well should be weathertight, stock-proof, and sealed around the ground surface.

A pond drop test may provide a more conclusive measure of water-tightness but only if there is a major leak. However, an effective LDS will provide a much earlier indication of leakage.

An alternative LDS technique that is relatively new to New Zealand is electric field testing. Water as a conductive medium is applied to a membrane surface, and a tear or leak in the membrane creates a fault that can be detected.

Good afternoon Mr Chair and commissioners.

As a result of the 42A Report there have been some significant changes to the original Proposed Plan.

Submitter No: 832

Main comments are

Submitter Name: Van Gool, Raewyn

Physiographics – in or outside plan. Waituna Partners Group Funding

General comment - Section 42A Report

Date Received: 13/9 /17

Wherever there is a change in setbacks in this report from 3 to 5m I disagree. Setbacks should remain as 3m wherever stated as in the proposed plan.

7.409 The use of the words “fully mitigated” in Policy 16 was carefully considered when drafting the pSWLP, where “fully” provides, in no uncertain terms, that there must be no adverse effects on water quality associated with the proposed activity. It is my view that removing the word “fully” may result in the approval of resource consent applications that have a minor adverse effect, which will not assist in achieving water quality outcomes for the Southland region. I do not recommend that clause 16(1)(b) is deleted, nor do I recommend that the term “fully” be deleted as requested by many submitters. **Delete fully**

X **mitigated/avoid wherever mentioned – Horizons experience**

Tile Drains 7.195 pg 204 It was noted by a number of submitters that mapping of currently installed drains would be onerous, as it would be difficult for landholders to determine where previously established drains had been placed. I acknowledge that this is a difficulty, particularly where land has been subdivided and drainage networks cross property boundaries with no obvious surface features. However, I consider that the lack of information about the nature and location of drainage networks is a significant impediment to managing them appropriately, in both a non-regulatory and regulatory sense. **For new drains or those maintained or upgraded, the requirement to map the drain and outlet is not onerous and, in my opinion, should be retained so that potential sources of contamination can be identified.** I also recommend that to better identify the outlet of drains, these should be identified and mapped. The submissions to delete the requirement to provide information to Council would defeat the purpose of the rule, as recording and providing this information to Council is the purpose of Rule 13(a)(v). **If the information is recorded but only retained by the landholder, it becomes redundant, and likely of no use to future owners or occupiers of the land.** *Can be retained on farm and produced when ES requires it.*

7.479 pg 254 Disagree – should be 30 May or 1 Jun I also recommend changing the date to 1 May to align with **the intensive winter grazing season** as suggested in the Environment Southland staff submission.

7.482 pg255 Under the notified Rule 20, sheep, beef and deer farms between 20 and 100 ha are explicitly excluded from preparing a nutrient budget under Rule 20(e). At this scale, these farm systems typically have very low nutrient inputs, so the marginal benefit of these farm systems preparing a nutrient budget is considered low. **In my opinion, the same argument applies to larger, extensive sheep, beef and deer properties.** The removal of a nutrient budgeting requirement for these properties would provide confidence that these farmers could prepare an FEMP themselves, possibly with support from their industry group. As nutrient losses from these extensive properties are generally low, I consider this to be a relatively low risk, for a considerable reduction in costs.

It is about total catchment load, therefore no farming system should be exempt.
Southland Economic project pg169 5 of the 7 deer farms had N losses 20-50kg/ha. These are not insignificant numbers

35b

7.948 Various exemptions from the PDT requirement are sought including:

- ☐ for synthetically-lined structures if they comply with IPENZ practice note, have a subsoil drainage and a leak detection system in place and a CPEng has certified the leak detection system will provide adequate leak detection;
- ☐ those with an inspection chamber;
- ☐ concrete-lined components of the effluent conveyance system if the structure has been visually inspected, there is no visible cracks or defects and a CPEng certification;
- ☐ those that have been suitably designed and built by a suitably qualified person.

7.950 ...Whilst the three and five year timeframes are largely arbitrary they have taken into account the review period of a discharge permit (typically granted for 10 years) to manage storage performance by requiring a test at least once every 15 years (maximum). This approach will also alleviate some of the concerns about the environmental conditions required to undertake the test as it allows a longer period for testing and therefore a bigger opportunity window to undertake the PDT.

7.951 pg 364 PDT **disagree** A number of submitters question the ability to perform the test because of the environmental conditions required to undertake the PDT. Whilst it is recognised environmental factors, for example wind and rain, can impact on the results, generally Page 365

these will be able to be accounted for, and therefore should not impact the ability to undertake the test. As mentioned above, it is recommended there is **either a three or five year period to perform the test depending on the construction materials which should enable sufficient time for the PDT to be undertaken.**

X *I question the capacity in practice for the recommendation to be viable. There are approx. 1000 dairy farms in Southland. If every one had to have a pond drop test within a five year timeframe that would be one test every 1.85 days – including weekends. If it was 1000 tests over 15 years (the maximum referred to in 7.950) it would still require a PDT to be carried out every 5.47 days. If however, LDS were accepted as a legitimate option to a PDT this would alleviate any capacity issues for PDTs in those systems that didn't have a LDS.*

7.952 Some submitters request exemptions to the PDT requirement. One of those exemptions is if the storage has inspection chambers or leak detection systems installed. While the use of inspection chambers is encouraged, they only identify leaks above the chambers which do not cover the entire surface of the storage. Therefore, I do not recommend an exemption is included for systems with leak detection systems.

X *I challenge the statement that LDS only identify leaks above the chambers and that chambers do not cover the entire surface of the storage. Our pond base is sloped towards a corner of the pond therefore any leak will eventually run in to the novaflow drainage chamber around the base or middle of the pond. Therefore any leak will eventually show up in the inspection sump. I stand by my comment in my submission that IPENZ state "A pond drop test may provide a more conclusive measure of water-tightness but only if there is a major leak. However, an effective LDS will provide a much earlier indication of leakage." It is disappointing that the recommendation in Section 42A report does not accept the IPENZ statement and dismisses a LDS as having no relevance nor advantage in environmental management. If a farmer with a LDS conducts checks of their inspection sump they will pick up a pond leak earlier than a 3 or 5 year PDT. If the recommendation of 7.952 stands then it will potentially encourage farmers with LDS not to check them and only rely on the 5yrly test as they will have spent considerably more money in attempting to use 'best practice' only to find ES does not consider the added expense of an LDS, has created any additional environmental advantage even though IPENZ states it allows earlier detection. ES should be encouraging farmers to use an LDS when upgrading effluent systems not ignoring them.*

ES Hearing verbal submission notes

At the annual ES on farm inspection, written records for inspection sump could be verified and at consent renewal written records of inspection could become a condition, where an LDS exists.

Writing the requirement for a PDT in to the plan can hinder innovation/use of new technology in leak detection. E.g. IPENZ state 'An alternative LDS technique that is relatively new to New Zealand is electric field testing. Water as a conductive medium is applied to a membrane surface, and a tear or leak in the membrane creates a fault that can be detected.'

7.406 Support Taking into account the submissions on Policy 16, I do not recommend adopting stronger policy direction that has the effect of prohibiting new dairy farming activities or new intensive winter grazing activities and therefore recommend that the submission from Fish and Game in relation to using the word "avoid" is not accepted.

7.477 Support While I support the intention of staging the FEMPs by physiographic zone, which targets those areas most susceptible to contaminant loss first, I agree that for those farmers on multiple physiographic zones, this approach is overly complex. Instead, I recommend amending Rule 20 so that FEMPs are staged by FMU, with timeframes aligned with FMU processes and commencing after the pSWLP is expected to be

operative. This would see very few farms required to prepare their FEMP by 1 May 2019 (Fiordland and the Islands FMU), approximately 1,500 required by 1 May 2020 (Mataura and Aparima FMUs), and the remaining 1,500 to be prepared by 1 May 2021 (Waiau and Oreti FMUs).

7.652 Broad agreement Combine Rules 21 and 22, and amend to read (noting no recommendation on activity status for new and expanded dairying):

7.653 Rule 23 be amended as follows (noted no recommendation made on activity status for additional winter grazing **Support changes made except date changes from 30 to 1 May and setbacks from 3-5m**

Rule 24 - Incidental discharges from farming. **Support**

7.898 Amend Rule 32 as follows: **Support**

7.1032 Rule 38 support I consider that the concerns raised by a large number of submitters to Rule 38 regarding the restriction of applying animal and vegetative waste between 1 May to 30 September are valid. There are potentially times during this period where it is suitable to apply animal and vegetative waste without having any significant adverse environmental effects. I consider that the risk that solid waste may be applied in inappropriate conditions is currently managed by the clause that restricts the application of solid waste when soil moisture exceeds capacity. **I therefore support those submissions requesting this clause (d)(iv) be deleted.** However, if the Hearing Panel considers that further restrictions are necessary in order to decrease the risk that any waste is transported to waterways during this period, they may want to consider increasing the setback requirements for the

Appendix N – Management Plan Requirements

It is interesting that the Section 32 Report in to costs of FEMPs does not value a farmers time in preparing a FEMP. Taken that farmers time is at least as valuable as a consultants with 3000 non dairy farmers and 1000 dairy farmers the total true cost of these plans is \$20million.

The Plan should not be required to be updated yearly – it should be 3 yearly, or 5 yearly where there has been no significant change in farming practices.

It should NOT be a requirement for a budget to be based on soil nutrient tests. This places an additional and unnecessary cost on to farmers especially in the current economic climate. Soil testing is only a guide of a given point/result at a given time.

An Overseer nutrient budget is limited in value in that it doesn't account for mitigation occurring on farm such as GMP, CSA management, wetlands, areas under QEII, native bush, etc. While all of these are held up as being good for the environment, currently they are totally discounted under Overseer. So those farmers with these areas are significantly disadvantaged when it comes to the final result compared to those that don't have any of these.

Reviewing the nutrient budget is an exercise in futility as weather has the potential to make a significant difference to what was originally inputted. E.g. approx. half N leaching in our budget is from rain and clover. Any significant change in either will change the end result.

A much better requirement would be not to have nutrient budgets prepared in advance as required in 4a, but to **require a nutrient budget every 3 years to use inputs that actually occurred.** This will be of more value to the farmer, will cost less (as they will not require a separate review) and will show what actually occurs in relation to nutrients when using actual input data rather than projected input data.

Good Management Practices

I commend the Environment Southland on the use of GMPs and by allowing the flexibility to adapt GMPs as science and innovation allows.

In closing I believe that the Plan is moving us in the right direction but as usual the devil is in the detail.

All land use 20ha or greater and all intensive land use 5ha to 20ha should be required to complete a Land Management Plan – based on Appendix N and subject to my comments above.