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One Plan

FARM Strategies – what are they and what are their implications to intensive farming in priority catchments

one plan
MOTE ITI MOTE RAHI

Objectives 6-1 and 6-2: Water management

- Surface waterbodies are managed in a manner which sustains their life-supporting capacity and recognises and provides for the values set out in Schedule D.
- Surface water quality is managed to ensure that:
  - water quality is maintained in those rivers where the existing water quality is sufficient to support the values of the river
  - water quality is enhanced in those rivers where the existing water quality is not sufficient to support the values of the river
  - accelerated eutrophication or sedimentation of lakes in the Region is prevented or minimised
  - the special values of rivers protected by water conservation orders and local water conservation notices are maintained.
- Groundwater quality is managed to ensure that the existing groundwater quality is maintained.

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Values and Standards

- Values range from:
- Ecosystem Values: Natural State, Sites of Significance
- Recreational and Cultural: Contact recreation; Maui; Shellfish; Native fishery; Trout fishery
- Water Use: Water supplies for domestic, stockwater, industrial, irrigation
- Social/Economic: capacity of water to assimilate pollution; flood control; drainage; infrastructure
- Standards: There are 44 Water Management Zones and 117 Water Management Sub Zones
- Each sub zone has water quality standards applied to it. Many of these standards are common to many sub zones. E.g. there are 5 standards for SIN and 3 for DRP.

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Priority Water Management Zones and the Regulation

- There are 11 priority zones or catchments, incorporating 34 sub zones, based on their seriously degraded water quality.
- In these zones intensive farming uses (dairy, irrigated sheep and beef (>4ha), cropping, commercial vegetable growers) are proposed to be regulated.
- Regulation is described as a controlled activity which means one can operate provided one meets the conditions attached to the rule.
- In this instant the primary condition is a Farmer Applied Resource Management Strategy – otherwise known as a FARM Strategy.
- Conversions to an intensive farm, anywhere, will also require a FARM Strategy
- Designed so farmers could achieve compliance with the Proposed One Plan (POP) relating to:
    - nitrogen-loss limits determined by Land Use Capability (LUC);
    - the reduction of phosphorous and faecal contamination of freshwater and;
    - the incorporation of other consent requirements within the Strategy

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Farm Strategy

- This strategy is, in effect, a best management practice plan for the farm directed at improving the farms environmental performance with particular emphasis on achieving the Nitrogen-loss limits.
- It comprises:
- mapping the farm – identifying farm block type, features such as streams, wetlands, bush, plantations, offal pits, bores, and any public amenities
- Identifying soil type and Land Use Class (either regional scale or farm scale)
- Obtaining fertilizer use records
- Stock reconciliation data
- Relevant Regional Rules
- Applying OVERSEER
- Establishing N and P loss, and identifying sources of faecal contamination
- Identifying options for mitigating N loss to meet standards and reducing P loss and faecal contamination

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Would It Work?

- Horizons wanted to establish whether this tool would achieve the purpose and if potentially yes, tease out the bugs.
- Also, Horizons needed to understand the practicality and cost of compliance including a cost comparison with meeting the performance targets of the Dairying and Clean Streams Accord (DCSA).

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The Results

- Six farm case studies were completed located near Dannevirke, Pahiatua, Eketahuna, Bulls and Marton. They comprised two dairy farms, one dairy and drystock farm, one a mixed farm of dairy, sheep and beef and cropping, and one proposed dairy conversion.
- The range of mean annual rainfall, LUC, and stocking rate was 900mm to 1865mm; I to VI; and 2.2 to 3.2 cows/ha respectively.
- OVERSEER® (version 5.2.6.0) was used to estimate current N-loss and P-loss risk and farm-scale LUC classifications were prepared for the calculations of POP N-loss limits.

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Results continued

- The FARM strategy will be based on, for the purpose of N-loss limits, the total farm area as opposed to the effectively farmed area.
- Case study farms with higher capability land had more generous N-loss limits.
- Farming within N-limits would be achievable for all the case studies.
- No farm required major changes to meet N-limits.
- N-limits could be achieved by meeting existing consent conditions, DCSA obligations, other POP Rule requirements, or by using mitigation practices such N-inhibitors.
- Similar results are expected for most pastoral livestock farms in the region. The exceptions may include ultra-intensive operations, intensive uses of marginal land, and areas with particularly high-risk combinations of land-use and environment.

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Results continued

- The prognosis for meeting 20 year N-loss limits is also promising although challenging (see next slide).
- Farming within N-targets alone has only minor financial implications for the case studies. Most would achieve compliance by fulfilling DCSA obligations and other POP requirements. Costs though for farms currently unable to meet farm dairy effluent consent conditions, and those with lower level infrastructural development, could be high.
- The case studies highlighted interpretive difficulties between the DCSA obligations and POP requirements.
- Minimum, Medium and Comprehensive level FARM strategies have been suggested, with minimum level strategies being suitable in most instances.
- Preparation costs for these strategies are estimated at $1500, $2,300 - $5,000, and over $10,000 respectively.

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N Loss – Current and Target

Year	2010	2015	2020	2030
Current N-loss (kg/N/ha/yr)	**26**	**26 (20)**	**26 (19)**	**26 (17)**
N-target (kg/N/ha/yr)	**20**	**19**	**17**	**16**
Difference (required reduction)	**6**	**7 (1)**	**9 (2)**	**10 (1)**

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Recommended Options for Mitigating N Loss

- Nitrification inhibitors (assuming a conservative 20% reduction) are estimated to reduce N loss by 5kg/N/ha/yr. A 6% increase in pasture yield would be required to break even.
- Stop fertilizer on new enlarged effluent block, reduce urea application to whole farm, purchase maize to offset pasture yield reduction. Net cost gain estimated at $3.3k/yr and N loss reduction of 3kgN/ha/yr
- LARRAL brown gold (effluent) treatment system. N loss reduction estimated at 2.6kg/N/ha/yr
- Fence waterways - estimated to reduce N loss by 0.2kg/N/ha/yr

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Some Issues Raised

- Use of total (legal) farm area vs effective farm area
- Use of support blocks or not
- Farms that are both inside and outside a priority catchment
- LUC “gap” between class IV and class VI
- LUC regional scale vs farm scale
- N Loss trading – spreading the risk

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