Draft Project Plan: Economic Impacts of Rotorua N reduction

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Summary	The costs of different approaches to reducing nitrogen losses in the Rotorua catchment will be assessed in terms of: • Relative impacts of different allocation options • On-farm impacts on profit and revenue • District impacts on GDP and employment.
Background	The proposed RPS has set a nitrogen limit for Lake Rotorua of 435 tN/y. To achieve this, the estimated total reduction is 320 tN/y with about 270 tN/y expected from the rural/pastoral sector. Of this 270 tN/y, the current framework proposes that 140 tonnes of N reduction is allocated to farmers. There are four key allocation options for how this reduction is distributed. The key options under consideration are: 1. Flat rate sector averages of 35kg/ha/yr for dairy and 13/kg/ha/yr for drystock 2. Sector averages adjusted for the influence of rainfall and soil type (i.e. with higher leaching allowances for leakier soils and higher rainfall, but with the same sector averages as for 1). 3. A flat percentage clawback from "Rule 11" nitrogen benchmarks, with final allowances fixed within the ranges of 30-40kg/ha/yr for dairy farming and 10-20kg/ha/yr for drystock. 4. A flat percentage clawback from "Rule 11" nitrogen benchmarks, with final allowances fixed within the range of 10-40kg/ha/yr for all farms. It is likely that individual farm benchmarks will be tradable in order to increase the flexibility of the regulation and reduce overall cost.
Objective	To assess the impacts of the different allocation options under consideration. This will include: • Total economic impact across the catchment • Economic impacts on different farm system types • Likely land use across the catchment once rules are imposed • Likely farm management scenarios once rules are imposed Given that trading is proposed, it will be important to assess the impact of different levels of trading inefficiency (for example if 15% or 30% of allowances are retained despite the opportunity for advantageous transactions).

Outputs	First, a catchment model will need to be developed in order to determine the impacts on farm profitability and the impact of trading on the total economic cost. This involves four key steps. 1. Develop representative farm system types: • Use rainfall and soil maps to inform discussions with local agricultural consultants and other people and establish distinct areas that we may distinguish as being relatively similar for modelling purposes. • Construct hypothetical representative farms (drystock and dairy) for each zone. This may consist of multiple types of one enterprise for each zone, if one type of agriculture is particularly dominant or disparate in that zone. 2. Establish a modelling protocol for pastoral farming: • Ask local consultants to establish a modelling protocol, alongside key DairyNZ staff (Alvaro Romera and Pierre Beukes), that they will utilise to prioritise mitigation actions when they decide how the hypothetical producers will respond to required reductions in N leaching. • Get this modelling protocol peer-reviewed and agreed by key stakeholders. 3. Determine relationships between profit and leaching: • Use local consultants to utilise the modelling protocol in OVERSEER and FARMAX to identify cost and leaching implications of the different mitigation scenarios for each representative farm system type. This will provide a set of relationships between profit and leaching. • Work with Scion to access data for forestry profitability. 4. A DairyNZ contractor will use the outputs of the BOPRC study, available data on forestry economics and BOPRC catchment data to develop a Rotorua Catchment bio-economic model. This model will then be used to test four different scenarios for the initial allocation of nitrogen discharge allowances: • Flat rate sector averages of 35kg/ha/yr for dairy and 13/kg/ha/yr for drystock • Sector averages adjusted for the influence of rainfall and soil type (i.e. with higher leaching allowances for leakier soils and higher rainfall, but with the same sector averages as for 1). • A flat percentage clawback from “Rule 11” nitrogen benchmarks, with final allowances fixed within the ranges of 30-40kg/ha/yr for dairy farming and 10-20kg/ha/yr for drystock. • A flat percentage clawback from “Rule 11” nitrogen benchmarks, with final allowances fixed within the range of 10-40kg/ha/yr for all farms. These four allocation approaches will be examined under four potential policy scenarios: • Mitigation at farm level, with no potential for trading of nitrogen discharge allowances

	• Trading with no transactions costs • Trading with 15% of allowances retained (i.e. 15% of potentially advantageous transactions do not take place) • Trading with 30% of allowances retained Second, A report will be developed for farm-level impacts based on this analysis showing: • Total economic impact across the catchment (in terms of profit and revenue) • Economic impacts on different farm system types • Likely land use across the catchment once new rules are imposed • Likely farm management scenarios once new rules are imposed Third, the on-farm catchment impacts will then be used to drive district-level analysis showing the economic impacts on employment, revenue and opportunity costs (etc.).
Scope Includes	• On-farm impacts for land in the Rotorua catchment. • Off-farm impacts on GDP and employment.
Scope Excludes	• Lake modelling • Cultural impact assessment • Social impact assessment

	Risk	**Mitigation**
Risks and mitigation	Timeframe too tight	Ensure adequate resourcing from outset, maximise use of existing datasets and knowledge, develop some parts of project in tandem, ensure brief but frequent communication between all parties.
	Lack of farmer cooperation	Collective members are positive about this project and the Committee and Coordinator will liaise directly with individual farmers to manage concerns as they arise. Results will be presented on a per hectare basis to maintain anonymity.
	Incorrect mitigation levels and/or costs	Industry standard software, assumptions and data will be used by local agronomic experts
	Inadequate resourcing	Maintain clear project management oversight with reporting to identify pending workflow. Identify industry funding and maximise use of existing work.

Success criteria	• The relationship between N limits and profit is understood for a range of Rotorua farm systems • The distributional impacts of different allocation options are understood for a range of Rotorua farm systems • The total economic costs are understood for different allocation options • Farmers have good information to engage with allocation options • BOPRC has good information on which to base its decisions • Public understand potential impacts of options consulted on • Final report delivered to BoPRC on time • Improved engagement between farmers and BoPRC

Milestones	**Stage**	**What**	**Who**	**When (2014)**
1	Set up	Agree scope and distribution of costs.	STAG Subcom.	July
2	Catchment model 1	Establish representative farm system types.		July
3	Catchment model 2	Develop modelling protocol.		August
4	Catchment model 3	Model profit/leaching relationships		August
5	Catchment model 4	Build optimisation model using data from 2-4.		Sept-October
6	Draft on-farm report	Use catchment model to write report on on-farm impacts. First draft delivered for feedback and review.		Sept-October
7	Draft district impact report	Use on-farm catchment analysis to support district impacts report (e.g. input-output).		Sept-October
8	Final reports	Incorporate peer review feedback and finalise reports		November