BEFORE COMMISSIONERS APPOINTED
BY THE WAIKATO REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of the First Schedule to the Act
AND	
IN THE MATTER	of Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments and Variation 1 to Plan Change 1
AND	
IN THE MATTER	of submission under clause 6 First Schedule
BY	Robyn Clements Submitter

HEARING STATEMENT OF ROBYN CLEMENTS

BLOCK 2, MAY 21st, 2019

STATEMENT OF ROBYN CLEMENTS

SCOPE OF STATEMENT

1. This Statement:

   (a) Introduces our Family Trust's farming business
   (b) Specifically I will focus on:-
      (i) Sub catchment planning (Rule 3.11.4.5)
      (ii) Stocking Rate (Rule 3.11.5.2)
      (iii) Nitrogen Management – Application of Nitrogen Reference Point and The use of OVERSEER (Policy 2 and 7 – Page 37; Rules 3.11.5.2 to 3.11.5.7 (inclusive) and Schedule 1 Pages 51-53 and Schedule B – Nitrogen Grandparenting)
      (iv) Convert farm land back to Forestry (Objectives 1,3, & 4; Policy 5 and 7, Rules 3.11.5.3 to 3.11.5.5 and Schedule 1)
      (v) Stock Exclusion (Rules 3.11.5.1 to 3.11.5.4)
      (vi) Restrict Land use change (Policy 6, Rule 3.11.5.7)

2. Introduction

   Our family trust owns a 364 ha King Country dry stock property in the Priority 3 sub catchment located in Waipa River Freshwater Management unit (Mangatutu sub catchment) in the Wharepuhunga district. The nearest towns to provide goods and services to the farm being Otorohanga and Te Awamutu.

   Photographs of the farm are attached to assist the Commissioners with a visual view of the farm description in my original submission. Our neighbours include another dry stock property, three dairy farms and a parcel of "land locked" Maori land covered in natural bush.

   Our farming philosophy is to farm sustainably and to the environmental capability of the land. Examples are we have fenced water ways where practical and installed an effective water system with water trough(s) to give stock access to water in every paddock. We plant natives annually to provide feed for the native birds that flourish around us with regular food source from both our bush, and on neighbouring properties, along with successful pest control. We have increased our sheep flock to run more sheep on our steepest hills and take bulls off that part of land. There is further details in the sub catchment section of this Statement outlining our activities to help preserve the Mangatutu Stream, a significant trout hatchery that runs through our farm.

Driving our farming passion and philosophy is a farming history that spans four generations for our two children Samuel - a rural banker, and Nicole – a student at Massey University. My father and my husband's father fought in World War Two and changed urban careers to become Waikato dairy farmers when they returned to New Zealand after the war ended. My mother and my husband's mother came from dairy farming backgrounds. My mother-in-law's side of family have farmed in the district near our current property for two generations before her. I joined my husband 40 years ago on his family dairy farm, and then together we increased our Family Trust's land ownership selling our dairy farm in 2006 after purchasing our current dry stock property in 2005.

I am also currently a Director on the Board of Primary ITO (Industry Training Organisation), and was a former Fonterra Shareholder Councillor when we owned our dairy farm.

I wish to submit to this Hearing once with the specific parts of Plan Change 1 I am commenting on being:-

3. <u>Sub Catchment Planning</u>

I support this approach and can demonstrate on our farm along with neighbouring farms that border on the Mangatutu Stream an earlier successful example. In 2006 we joined a collaborative project with Environment Waikato to stabilize the stream and improve water quality along with 23 other farmers, iwi, Fish and Game. The stream is 40km long and a tributary to Punui River with the project focusing on 20km. On our farm we invested $35,000 that was matched by Environment Waikato to realign the river where it had gone off course due to a number of factors. These included poor planting choices and location of plants on a neighbouring farm that forced water flows to change substantially when there was heavy rain and created additional bank erosion from the strong currents. There was a variety of other investments by the other 23 farmers and work done relevant to the issues of each farm but with a whole stream improvement approach. Mangatutu Stream continues to be recognised as a significant trout hatchery stream and a regular swimming waterway for the local community in several popular spots. The project's success is well documented through council records. This is also a stream that my husband has had over 60 years of association with and he has observed the continued improvement of its water quality. While obviously a personal observation rather than scientific, the water is that clear that we can see trout swimming in the stream from both close to the water edge and from much higher up on the hills that look down on the stream, along with clear visibility of the stones on the stream bed (visibility naturally diminishes with heavy rain fall). I have attached the Work Plan for our part of the stream prepared by Environment Waikato which is imposed on an aerial view of our farm and the stream – titled "Stewart & Clements Properties Maungatutu River Works", dated 12 November 2006.

While this is a small example compared to PC1 the same principles apply but the current implementation method in Rule 3.11.4.5 does not provide the authority or enable an integrated sub catchment management and community and farmer initiative through the Objectives, policies and methods including rules of Plan Change 1.

4. Stocking Rate

Our stock rate and mix has changed and evolved since we purchased the farm in 2005 in response to market signals, changing health and safety issues and impact on farm environment. It is essential for our farming business to be able to respond in this manner in order to be sustainable both economically and environmentally. Currently Rule 3.11.5.2 does not recognise the difference between a lactating dairy cow versus dry stock, the difference in quantity of drinking water required by non-lactating stock, and lower levels of nitrate excreted by dry stock. A Farm Environment Plan specific to each farm could ensure the stocking rate matched the capability of the land in question.

5. Nitrogen Management

I support earlier evidence you have had presented from Beef and Lamb NZ and Farmers for Positive Change that approaches to managing emissions for nitrogen from our dry stock farm should not be based on grandparenting as the Nutrient Reference Point approach in Plan Change 1 proposes.

In addition to their evidence on fact Overseer's modelling formula is not fit for purpose I have included the following newspaper articles challenging Overseer's accuracy:-

Alfred Harris, First Class Honours Degree in Cytogenetics, Research Manager Pacific Biocarbon, NZ Farmer January 30, 2017 Page 7 – "Can we have faith in Overseer?"

Dr Samuel Dennis, Soil Scientist, NZ Farmer March 27, 2017 Page 14 – "Nutrient software queried"; and NZ Farmer April 17, 2017, Page 7 – "Letters to the Editor "Overseer's limits" . Overseer is also not effective as a measure for other contaminants that PC1 has identified.

I do support the use of individual Farm Environment Plans to determine land use capability and individual farm base discharge allowance. Again I appreciate Beef and Lamb NZ and Farmers for Positive Change have provided you data and expert evidence at a much higher level and in more detail than I can on this point. However I hope to convey to you as a former dairy farmer I know from first hand observations and personal experience the different approaches to fertiliser management, particularly low levels of nitrogen that was applied historically to our dry stock farm compared dairy.

Plan Change 1 in its current format fails to give credit to lower users (both dairy and dry stock) of nitrogen, and to farmers that have pro-actively engaged in environmental practices that enhance their land for the future, and in some cases protected it for future generations as with QEII Trust protected land. This restriction and lack of flexibility not only limits us today with growing more pasture or crops but the next generation of farmers. It is not about us wanting to apply excessive levels of nitrogen on our dry stock farm but through a farm specific Farm Environmental Plan look at what options we could have that is at an environmentally responsible level and matches land capability.

6. Convert farm land back to forestry

I refer to (and have attached) an article in the NZ Farmer April 24, 2017, Page 7 by Geoff Prickett, a retired Gisborne Farmer on what happened on farm land and water ways over 45 years with positive improvement to water quality and reduction in flood levels after the first 30 years from planting of local forests. However at harvest time when large scale logging began on the hills it left exposed vulnerable erodible land that with heavy rain washed soil, large amounts of slash and under par logs downstream "one big rain event could and did reverse 30 years of environmental benefits... our beautiful little river was transformed in high flood into brown sludge carrying not just slash but a continuous flow of short-end logs.... all this logging debris was carried in a thick slurry of precious topsoil and biomass." He goes on to detail its devastating effect on fish life and shell fish as the water way flowed into tidal rivers and estuaries.

Since this article it has been well documented of similar stories around New Zealand on much bigger scales. Climate change has obviously subjected land to adverse weather events, and more often than historical weather patterns. The whole purpose of Plan Change 1 is to improve water quality over the next 80 years and in doing so naturally require a reduction in sediment, nutrient, and microbial pathogen discharges. However ironically Waikato Regional Council wants to convert current fertile, efficient food producing Waikato land back to forestry on a massive scale without an 80 year vision of what happens to the waterways when those forests are harvested.

This focus on forestry farming also has negative consequences for communities, their residents and New Zealand Inc with corresponding eradication of jobs, decline of rural economies and social impact. It is imperative a robust detailed cost benefit analysis covering both social and economic factors be undertaken as referenced in my initial submission.

7. Stock Exclusion

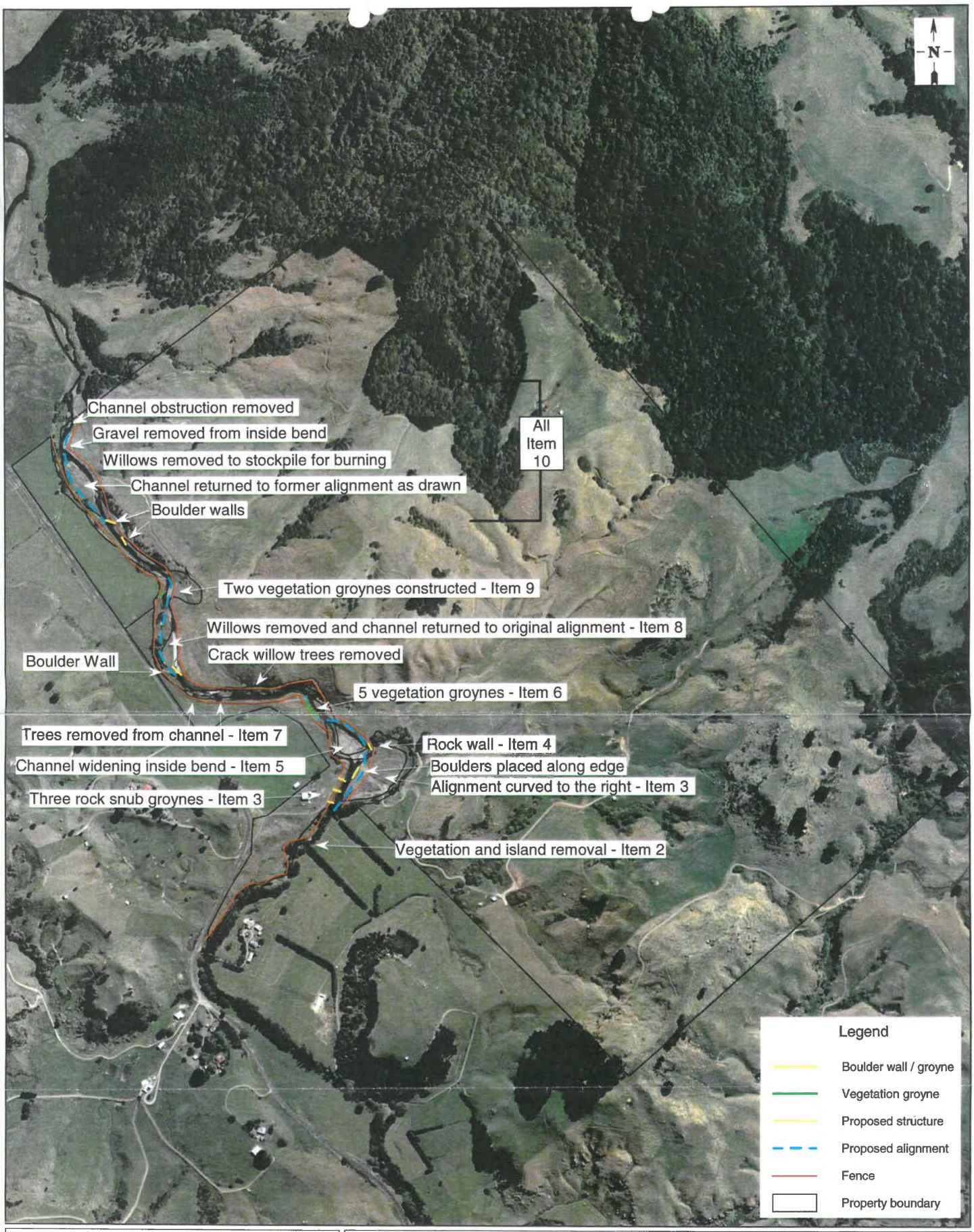
I support the intention to exclude stock from water ways but have requested an amendment to the current blanket approach. On our farm we need flexibility as a water way has altered course over the years leaving a bridge now located on dry land instead of giving access over the water to part of the farm land. Through a Farm Environmental Plan specific to our farm we could document we have non-lactating stock that could be taken quickly through the water in a controlled situation at intermittent periods during a year and depending on the season. For the amount of land involved it would not be economic to put in a new bridge.

In addition there are fencing challenges to some water ways due to the nature of steep slopes and areas of solid Rhyolite rock. These challenges are far greater than on typically mainly flat to rolling dairy farm land. The challenge is both physical and economic – in our case we have fenced as many water ways as practical rather than all water ways so we still had money to make a major investment in improving the water reticulation on our farm so that all paddocks have water access in a trough(s) for stock.

8. Restrict Land Use Change

This part of Plan Change 1 I presume is to actively prevent any further conversion of land to dairying however the are unintended consequences for other types of land users. On our dry stock farm if we are to have any chance of attracting our children or associated wider family members to consider coming back to our farm we need flexibility to let the future generation apply their own innovation and new science and/or farming practices. They need to be able to respond to market changes so they can farm in both an environmentally sustainable way and have an economically sustainable business. If for example synthetic meat displaced our beef stock they may decide to put some of our flat fertile paddocks into vegetables and/or plant the steeper parts in manuku so they can develop a honey business yet Policy 6, Rule 3.11.5.7 severely restricts and in effect stops this type of land use change.

Rarely has business or industry in New Zealand ever put up that kind of barrier to future generations. There needs to better process prescribed where farmers could effectively put a business case as to why a land use change would be positive. This would need to include environmental benefits, as well as making a sustainable profit. The flow on benefits would not only be for the individual farmer, and the land, but also recognise new jobs potential and money filtering through to the communities that provide the goods and services to that particular land.



Stewart & Clements Properties
Maungatutu River Works

Created by: Nova Caie
Projection: NZTM
Date: 12 November 2006

Status: Draft
Request No.: 14678
File name:14678

For Environment Waikato staff only

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Meters

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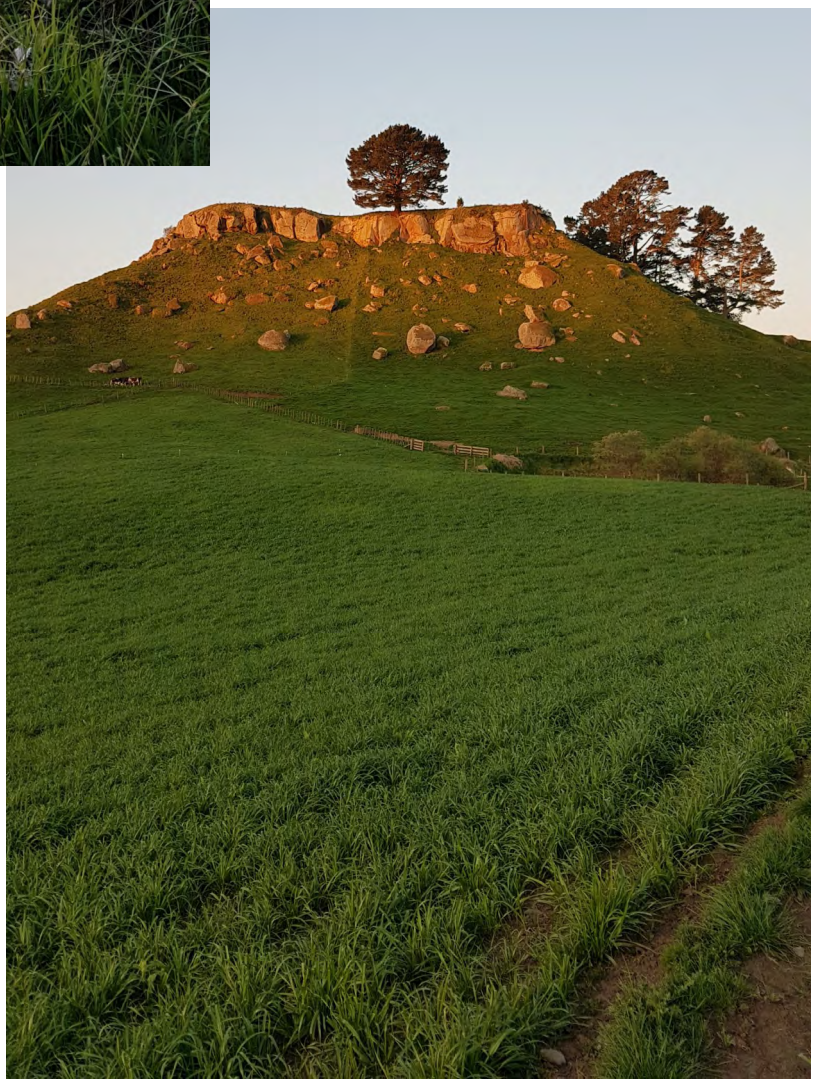
Environment Waikato
REGIONAL COUNCIL



Can we have faith in Overseer?

Alfred Harris expands on his view that Overseer is an 'out-dated nutrient balance model owned by those with vested interests'.

How much cadmium accumulates in eels that live for many decades?

Think models and most Kiwi males will think beautiful women, the one night stand, the stuff of the imagination. But there is also a song that goes: "If you wanna be happy for the rest of your life, never make a pretty woman your wife".

So has the Waikato Regional Council, in its desire to set regulatory standards for nutrient runoff from farms, gone after the pretty woman model? Will the regional councillors wake up on the morning after passing the Healthy Rivers/Wai Ora District Plan variation, which relies on the Overseer nutrient budget model, to find themselves in the High Court facing a legal challenge by farmers?

I hope councillors see sense and heed the call of Federated Farmers for a paradigm shift at all levels of science and policy.

Overseer's owner, Overseer Ltd, represents some of the worst aspects of the old discredited model of taxpayer science funding and hides the potential conflicts of interest of the Overseer Ltd shareholders. The shares in Overseer Ltd are split 50:50 between AgResearch Ltd, which is effectively a state-owned enterprise, and the NZ Phosphate Company. The Companies Office records disclose that the NZ Phosphate Company trades as the Fertiliser Association of NZ. The shares in the NZ Phosphate Company are split 40:40:20 between Ballance Agri-Nutrients Ltd, Ravensdown Ltd and GreenGro Resources Ltd. Greengro Resources Ltd has one shareholder, Ravensdown Ltd.

Has the Ministry for Primary Industries fallen prey to arguments presented by vested interests as good science? MPI says on its website that it is a major funder, user and generator of science. Where is the incentive for the AgResearch "business" generating income for the Government to raise fundamental scientific questions about the model being used for measuring nutrient runoff when half the shareholders of the "business" are fertiliser companies presumably with no interest in reducing the amount of fertiliser being sold? As a farmer mate of mine with a keen interest in science frequently asks me: "Whose science do I trust".

The Waikato Regional Council and MPI are responsible if the decision about whose science we trust is made by the High Court and not from an independent taxpayer-funded critical analysis of the science that lies behind Overseer.

The regional councillors need to ask themselves two questions:

· Can I trust the science behind the Overseer nutrient budgeting model when the two largest fertiliser companies in NZ own 50 per cent of Overseer Ltd?

· Can I trust the company that owns Overseer which is 50 per cent owned by the two biggest fertiliser companies in NZ to rework their nutrient budget model in the light of research which suggests that simple changes in management practices and beneficial fungal associations with pasture plant roots can potentially reduce soluble fertiliser requirement?

· Given that nutrient loss from land has a huge impact on freshwater quality, when will Overseer Ltd invest in research to incorporate in their nutrient software budgeting model the results of their own research on the plant and pasture plant accumulation and concentration of cadmium.

Research published this year by the Fertiliser & Lime Research Centre at Massey University shows that cadmium accumulation in chicory and plantain, two increasingly popular forage crops, is much, much higher on average than ryegrass or clover. Levels of accumulation of cadmium in chicory and plantain at the top end of the range are downright frightening.

Cadmium is vitally important in any consideration of healthy rivers. Cadmium continues to accumulate in the soil because the two big fertiliser companies continue to manufacture superphosphates from cheap rock phosphates high in cadmium.

This cadmium then washes through the soils and is concentrated through the food chains in freshwater ecosystems to much higher levels than in farmed animals. Species like eels at the top of the food chain are exposed to cadmium in the water, in the sediments and through accumulation in the food chain. Customary fishers eat a lot of old eels, and large smoked eels are exported to Europe.

Given that the kidneys of sheep and cattle older than two years are deemed unsafe for human consumption, one wonders where and to what concentration cadmium accumulates in eels which live for many, many decades.

Why does the Waikato Regional Council not routinely measure the cadmium concentrations in eels and other food species like trout?

Modelling is essentially about mathematics. Like any model, Overseer reduces to mathematical equations (algorithms) the complexities of different soil types, pasture plants, root depths, and rotation lengths. Modelling begins with things as simple as averages.

According to the OECD world river database's mean annual data the Waikato River is one of the cleanest rivers in the world. Pristine though the Waikato may be at its source in the mountain streams that run into Taupo, the same cannot be said of the lower reaches after the river has passed through towns, industry, and farmland.

All science is the simplification of uncertainty. Mathematics represents the greatest simplification of that uncertainty. The greater the simplification of the uncertainty the greater the doubt politicians should have about the ability of mathematical models to predict the real world.

Modellers, as distinct from the people who use models, know that models have limited value and they see them primarily as tools contributing to open discussion and debate. Models help identify gaps in research, flaws in the mathematical equations, and how to account properly for the experience of farmers.

As I am sure modellers would agree there is a huge level of risk in using models to predict the future. They have grave concerns about models taking on lives of their own when used for regulatory purposes by regional councils.

In an important paper on the Guidelines for the Admissibility of Farm and Catchment Models in the New Zealand Environment Courts one of New Zealand's leading modellers, Dr Aroon Parshotam, suggests that courts could apply the following criteria to the regulatory use of models such as Overseer

· Have the theories used to design the model been scientifically scrutinised?

· Has the model been published and have other scientists had the opportunity to review the science?

What is the inherent error involved in the modelling process?

What are the standards and controls used in the operation of such a model and how are they maintained?

How is the model used regarded by other professional modellers?

It is Parshotam's view that many catchment or farm systems models (such as Overseer used in New Zealand would not pass such a test.

Waikato Regional Councillors would be well advised to listen carefully to Federated Farmers when they advocate the use of science and innovation to underpin resilient, profitable farming systems.

Federated Farmers suggests that politicians re-engage the ingenuity, innovation and pragmatism of farmers and scientists to capitalise on the productivity of the land-water interface, including ways to integrate aquaculture and agriculture in inland waterways and estuaries. The use of out-dated nutrient balance models owned by those with vested interests does not support the far-sighted vision of Federated Farmers.

In linking the innovation, energy and practical experience of farmers with the innovation of taxpayer-funded scientists, New Zealand can once again lead the world with pastoral farming systems that not only mitigate greenhouse gas emissions but regenerate rural economies, communities and environments.

Alfred Harris has a first class honours degree in cytogenetics and spent much of his research life using electron microscopes and X-ray analysers to study soils, composts and biocarbons. He is now the research manager of Pacific Biocarbon.

Nutrient software queried

Independent soil scientist Samuel Dennis has become increasingly disenchanted with the way the Overseer programme is being used. **Tony Benny** reports.

Independent soil scientist Samuel Dennis with his farmer father Chris on the family farm at Glenroy, Canterbury.

Samuel Dennis grew up on his parents' sheep and beef farm at Glenroy, in the foothills that rise from Canterbury Plain, inland from Christchurch, and today he and wife Sarah live with their six children on a corner of family property.

Until two years ago he worked in AgResearch's farm systems department. He studied soil science at Lincoln University, graduating with an honours degree and completing a PhD.

"When I was at school I had a very strong interest in science and I was studying things from a creation perspective at home and from an evolution perspective at school," Dennis, a committed Christian, says.

"That tension caused me to have to think critically and critical thinking is essential for science so that ended up leading me into a science career."

But the 10 hours a week spent commuting to Lincoln became too much for Dennis. "Our fifth child was on the way at the time and I realised I was just not getting enough time with the kids.

"We were wanting to home school and I thought, 'I'll go out on my own and make it work'," he laughs. "So that's what I did and I'm still here."

Since striking out on his own Dennis has done contract science work for large organisations like AgResearch, DairyNZ and Beef + Lamb NZ, as well as for individual farmers, doing Overseer nutrient budgets for environmental regulation compliance.

But he's become increasingly disenchanted with the way the computer modelling programme is being used.

"I'm really trying to pull back from Overseer modelling for individual farmers because the more I look into it and the more different ways of farming I see, I realise I just can't trust the numbers.

"I'm just not professionally comfortable with reporting numbers based on Overseer knowing they will be used to assess regulatory compliance, because it's just wrong in many cases."

Dennis says Overseer works well for what it was designed for, working out farm fertiliser recommendations, but not as a regulatory tool.

"Overseer was developed to work out fertiliser recommendations and in order to do that, it has to work out how much nutrient is being lost. You need that to work out how much fertiliser you're going to have to apply to replace it so it's an important number and on a statistical average basis, it's good enough.

"If you get your fertiliser recommendations slightly wrong, it doesn't matter because you're going to pick it up in your fertiliser tests a few years later and you'll correct it. There's no regulatory consequences of it."

> There are definitely opportunities opening up with new technologies that aren't available yet and that's what I'm trying to work on.
> **SAMUEL DENNIS**

But real farms are far more complicated than allowed for in Overseer, Dennis says.

"It can only account for the few things that have actually been researched in sufficient detail to put into a model. There's far more that's not in the model that's happening on a real farm than is in the model."

Dennis says one paddock can have several soil types but that, along with topography, variable pasture composition and tree lines, is among many factors that affect nutrient loss but for which Overseer isn't flexible enough.

"Most critically, changes in soil organic matter over time are almost completely ignored.

"Most of the research has been done in flat highly productive pastures, very little has been done in the high country. When you get up into the hills, when you get into higher rainfalls, anything on different soil types, anything that's away from the standard conditions that you tested, the model's accuracy is going to rapidly fall away."

On top of his doubts about the accuracy of the figures Overseer produces, Dennis finds the whole farm environment plan process frustrating.

"The farmer's only called you up because the council told him he had to and it takes a fair bit of time to do the work so you end up having to invoice them a fair amount of money.

Chris Dennis uses "time-controlled grazing", also known as holistic farming, grazing stock together in large mobs in small paddocks and shifting them daily.

"It's the most depressing thing to invoice someone for something they never actually wanted to do in the first place and doesn't actually deliver any real value to them whatsoever."

Dennis believes rather than computer modelling a far better way to assess farm nutrient loss would be by actual measurement, something until now deemed unaffordable and impractical but which emerging technology should make possible.

"There are definitely opportunities opening up with new technologies that aren't available yet and that's what I'm trying to work on. There are technological solutions in other industries that I can repurpose, put it that way."

Wary of saying too much in case his ideas are stolen, Dennis believe there's potential in a number of different approaches.

"There's a couple of different methods that I'm in the process of designing and getting under way."

"I'll be looking for clients who have complex situations they believe aren't being accounted for who would be happy using experimental approaches to try to work out what their situation is while I refine the technology that I'm working on."

Meanwhile at home Samuel's father Chris has adopted holistic farming techniques, another of the variations not accounted for in Overseer, Samuel says. He prefers to call the system "time-controlled grazing", whereby large mobs are rotated through small paddocks with daily shifts and long recovery times, trampling down long pasture as they go and building up soil organic matter.

"You've got a lot more trash left behind and all of their urine and dung is going on top of this surface litter layer which is much deeper than your regular pastoral situation. A certain amount of the nitrogen is going to be used just in the litter layer before it even its the soil."

Under time-controlled grazing, pasture should develop bigger root systems and these should pick up more nitrogen before it can leach out, he argues, adding that urine is more evenly distributed and international research shows phosphate run off is reduced in this type of grazing management.

"But that's not accounted for in Overseer. It's an extreme example of a farm system where you can see all of these different things that just aren't accounted for in the model.

"On a different scale, a lot of that's true for any farm – there's a lot of stuff that any farmer would be doing that's not properly accounted for in the model."

Millions of dollars are being sucked up by Canterbury's licence-to-farm approach of drawn-out planning processes, mandatory requirements on all farmers, auditing etc.

Have your say

Lost confidence in Overseer

The excellent article by Samuel Dennis [March 26] on the failings of Overseer show the value of combining scientific knowledge and a practical farming background.

There is a widespread loss of confidence in Overseer in our area of Canterbury. The inherent limitations and inaccuracies with Overseer meant it should never have been used for regulation and needed a legally binding caveat to that effect. Overseer has learnt the hard way that if you allow your product to be used by a regulatory authority [particularly a draconian one like ECan] it can destroy the reputation of your product.

Dr Dennis struck a critical point in noting the huge variability in farming particularly in the dryland sector. Flexibility is crucial to farming especially given our vulnerability to climatic and seasonal variations. What the nutrient planning process in Canterbury has demonstrated is that regulatory planning by numbers does not work. Attempts to make it work come at a substantial cost, creating a hugely complicated framework that nobody can understand and still, does not work.

All farmers in our area are required by ECan to do Overseer. ECan has set the bizarre rule that the higher your Overseer number the more development benefit you have. So the inevitable has happened with a widespread inflation of numbers as farmers attempt to get the highest baseline number possible. Another reason why models like Overseer should not be used in regulation.

Dryland farmers ask what they are supposed to do with the Overseer report and are being told they need to keep it in the drawer [with the mandatory farm plan] in case the regional council asks for them. The situation is now so farcical that industry groups and consultants are advising dryland farmers not to do Overseer – not much consolation for those farmers that have spent $2000-$3000 for something that just sits in a drawer.

What is particularly disappointing with Overseer CEO Dr Caroline Read's response is that she completely ignores the valid concerns raised by Dr Dennis. Dr Read then goes on to perpetuate the Fish & Game doctrine that every farmer requires a licence to operate (and of course by implication will need to use a model like Overseer). Why is it only farmers require a licence to operate when everyone – manufacturing, tourism, urban etc – impact on the environment?

The view that all farmers need a licence to operate is contrary to our fundamental rights under New Zealand's environmental legislation which require councils to identify where the water quality issues are, what are the main causes and what planning framework is the most effective and efficient in addressing the issues. A blanket licence to operate is also contrary to the legal parameter that regulatory requirements on people should be commensurate to the degree of impact of their activity.

The fallacy of Dr Read's thinking is being laid bare in Canterbury as many are starting to realise that the millions of dollars being sucked up by the licence-to-farm approach of drawn-out planning processes, mandatory requirements on all farmers, auditing etc is unsustainable. There is also increasing recognition that we already have an excellent model in the catchment board system still used in regions like Taranaki. It operates at a fraction of the cost, works in partnership with farmers and delivers so much more on the ground. And it is in this sort of voluntary system that tools like Overseer and farm plans can be very useful.

Jamie McFadden
Cheviot

Overseer's limits

In light of the controversy caused by recent comments of mine regarding Overseer, I would like to bring the discussion back to the science and clarify a few matters.

Overseer is a good model, developed by good scientists, many of whom I have worked with personally. However, it is limited in ways that severely affect how it should be used.

A computer model is just a complicated mathematical equation. The model only "knows" what people have put into it. To give a very simple example, Overseer "knows" about livestock stocking rates, fertiliser type, and slope, which may affect P loss. It does not "know" about whether a forage crop is grazed up or down slope, pasture post-grazing residual, or dung beetles, which may also affect P loss (according to AgResearch, the USDA, and Landcare Research respectively).

Overseer can be used to answer the question "to reduce P loss, is it more effective to reduce stocking rate or to switch from superphosphate to slow-release RPR fertiliser?"

Overseer cannot be used to answer the question "if different post-grazing residuals are used, how may this alter P loss?", because Overseer has not been programmed to understand post-grazing residual.

Since Overseer does not understand the effect of grazing strategy (post-grazing residual, grazing direction), yet both certainly vary between farms and may alter P loss, Overseer is not able to accurately estimate total P losses from a property (this is just one of many reasons).

Farms are very complicated, and although the model is improved every year it will never be able to account for all relevant factors. This is not about so-called "holistic" practices, these issues affect all properties. However, alternative management introduces even more factors that are inadequately researched and thus not in the model, making this issue particularly pertinent to such properties.

Overseer cannot accurately estimate actual N and P loss, as anybody who has seen their numbers change with Overseer updates as it is progressively improved knows well. However while the absolute numbers jump around between updates, the general trends stay the same (superphosphate still causes more P loss than RPR). The trends are sound and reliable, the absolute numbers are not.

It is therefore inappropriate for a council to estimate actual leaching losses from farms using Overseer, to compare against regulatory limits. However, where real environmental losses have been physically measured in receiving waters, and are understood to originate from a particular farm, Overseer can indicate which of those strategies that are recognised by the model may be most effective in reducing these losses. Overseer can inform management decisions, but not accurately assess compliance with regulatory limits.

Dr Samuel Dennis
www.grounded.co.nz

Logging's damaging 'acts of God'

Geoff Prickett writes about the devastating 'collateral damage' forestry brings to vulnerable hills at harvest time.

NZ Forest Owners Association president Peter Clark was beating the drum again for plantation forestry in the NZ Farmer (April 3). Much of his advocacy is based on the supposed environmental benefits of forestry relative to pastoral farming.

Mr Clark talks of discharge mitigation costs. Rather smugly he states, referring to hill country farmers: "A dilemma now confronts drystock farmers – fence off or get off!" Given the downstream costs of the logging industry, this comment from an industry spokesman is both arrogant and delusional.

Over 45 years' farming and living in the hill country between Wairoa and Gisborne I saw the expansion of forestry plantings in the 70s and 80s and I was witness to the arrival of large-scale logging on the hills and its consequences.

In the mid-70s, a large area of the Wharerata hills, some reverted scrub and some clean grazing country, was bought up and planted in trees. Incidentally the last colony of blue ducks or whio living in coastal hill country in the North Island was a casualty of this process. Their home territory was sprayed from the air and burnt and the ones that didn't die in the fire lost their life supporting environment and were gone in a couple of years.

Living downstream we watched for 30 years as the plantations grew. Our flood levels reduced, the creek which we crossed to get into our property ran cleaner and healthier and there was a reduction in flood debris. This was easily monitored every time I took a crowbar down to clean our low-level crossing after rain.

The Forest Owners Association would be pleased with these observations. They ran an ad in many newspapers at the end of last year. It showed a young woman taking water samples from a beautiful clean creek surrounded by native regrowth against a background of hills covered in pines. The message was clear, forestry is saving and protecting our creeks, rivers and water, not to mention the biodiversity including we humans who rely on that clean water.

Logs and forestry rubbish was washed down the Waikakaho Valley Marlborough after flooding late last year.

But at the turn of the century it all began to change. Large-scale logging began on the hills and with it wholesale collateral damage downstream. Modern logging techniques with their heavy machinery and log-haulers left exposed and deeply gouged hillsides and tremendous amounts of slash and under par logs just waiting to be washed downstream with the first heavy rain.

It would be fair to ask that the NZ Forest Owners Association returns, after the area has been logged, to that little creek which featured in their advertisement of last year. Much of the native vegetation will be gone. The logged, stripped, deeply gouged and highly vulnerable hills will be littered with slash and logging debris.

The vulnerable erodible East Coast hills simply fell to pieces. One big rain event could and did reverse 30 years of environmental benefits.

We experienced several such events. Our beautiful little river was transformed in high flood into brown sludge carrying not just slash but a continuous flow of short-end logs. And not always short, one such flood left a 20-metre pine log draped over our cattlestop. All this logging debris was carried in a thick slurry of precious topsoil and biomass.

Downstream the damage continued. Low lying flats could be covered in logging debris – and often were. Tidal rivers and estuaries critical to many fish and shellfish species have become clogged with debris and silt. This has badly affected our inshore fisheries.

In early October 2015 the Gisborne Herald carried a story and a picture of the lovely clean town beaches and commenting how good it was that unlike previous years there was a minimum of logging debris. The writer spoke too soon. The following week, after a good spring rain, the same beaches were covered from one end to the other with a huge pile of wood.

The recent rains in Auckland saw more logging derived flood damage, this time in the Ness Valley just south of the city. The residents and landowners like all the others affected by similar events will presumably be left to clean up the mess and carry on until the next time.

There have been many similar events all over New Zealand where large-scale logging on vulnerable hills is hit by a heavy rain event.

Some years ago the Nelson region was hit. One valley behind Motueka was particularly affected when a logjam of debris burst in a flood and did great downstream damage. Northland has been badly affected, as has the Coromandel.

These events are seen by the logging industry as unfortunate collateral damage. I have heard them described by forestry people as 'acts of God'.

Yes, I know Gisborne and the East Coast has become highly dependent on the forestry industry.

There is no doubt it has created many jobs for the region and the economic spin-off of all those trees coming of age has been tremendous. But there is a huge price being paid both in wider environmental costs and direct costs borne by so many individuals and families.

It would be fair to ask that the NZ Forest Owners Association returns, after the area has been logged, to that little creek which featured in their advertisement of last year.

Much of the native vegetation will be gone. The logged, stripped, deeply gouged and highly vulnerable hills will be littered with slash and logging debris and the creek will have exchanged its fresh water and biodiversity for deeply degraded drain. It will all be waiting for a good heavy rain so it can head off downstream. Is that a recipe for a better future for New Zealand's hill country?

For both farming and forestry, times move on and the systems and assumptions of the past are no longer good enough. Judging by Mr Clark's comments the farming industry can at least claim to be ahead of his industry when it comes to accepting this and doing something about it.

▮ Geoff Prickett is a retired Gisborne farmer.