In the Environment Court
at Wellington

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in the matter of: appeals under clause 14 of the First Schedule to the Resource Management Act 1991 concerning proposed One Plan for the Manawatu-Wanganui region

between: **Federated Farmers of New Zealand**
(ENV-2010-WLG-000148)

and: **Minister of Conservation**
(ENV-2010-WLG-000150)

and: **Horticulture NZ**
(ENV-2010-WLG-000155)

and: **Wellington Fish & Game Council**
(ENV-2010-WLG-000157)

and: **Andrew Day**
(ENV-2010-WLG-000158)
Appellants

and: **Manawatu-Wanganui Regional Council**
Respondent

and: **Fonterra Co-operative Group Limited**
Section 274 Party

Statement of evidence of **Terry Graham Parminter** for Fonterra Co-operative Group Limited

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Dated: 18 March 2012

REFERENCE: John Hassan (john.hassan@chapmantripp.com)
Luke Hinchey (luke.hinchey@chapmantripp.com)

Chapman Tripp
T: +64 9 357 9000
F: +64 9 357 9099

23 Albert Street
PO Box 2206, Auckland 1140
New Zealand

www.chapmantripp.com
Auckland, Wellington,
Christchurch

CHAPMAN TRIPP

STATEMENT OF EVIDENCE OF TERRY GRAHAM PARMINTER FOR FONTERRA CO-OPERATIVE GROUP LIMITED

INTRODUCTION

1 My full name is Terry Graham Parminter.

2 I am the Managing Director of PACT Consulting Ltd, established in 2010 to provide strategic management services and social research for central and local government agencies and primary industries.

3 My academic qualifications include a PhD in Management Systems from the University of Waikato (2009) and a Bachelor in Agricultural Science from Massey University (1979). My PhD resulted from research into "*An examination of the use of a human behavioural model for natural resource policy design and implementation by government (central and regional) agencies*".

4 Prior to forming PACT Consulting Ltd, my working career has included six years as a Farm Advisory Officer with the Ministry for Primary Industries (formerly the Ministry of Agriculture and Forestry (*MAF)*), six years as an agricultural systems scientist with MAF, and thirteen years as a social scientist with AgResearch studying technology adoption by farmers and strategies for effective voluntary policies. In 2005, I presented expert evidence on non-regulatory policy approaches to the Environment Court in the context of appeals on the proposed Waikato Regional Plan relating to the matter of two references under clause 14 of the First Schedule of the Resource Management Act 1991 (*RMA)* to the proposed Waikato Regional Plan.

5 I have published in a range of academic and conference journals related to human behaviour, behaviour change, policy formulation and farming systems. These publications have included the Australasian Society of Social Psychology, the Australasian and Pacific Extension Network, the NZ Agricultural and Resource Economics Society and the Australia and New Zealand Systems Society. I have also published two books on the design of environmental policy and have been recognised as a senior consultant with the NZ Institute of Primary Industry management since 1997, certified as a practicing agriculturalist with the Institute of Agricultural and Horticultural Sciences (1993) and certified in resource management with the NZ Association of Resource Managers (2010).

6 I am familiar with the Proposed One Plan (*POP*) to which these proceedings relate. In particular, I presented evidence at the Council level hearing in relation to the POP.

7 I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

8 My evidence will deal with the following:

8.1 An outline of different policy principles and methods for designing policy interventions for social and human behaviour change and the roles of regulatory and non-regulatory policy principles and methods to achieve behaviour change.

8.2 Human and social behaviour change and the principles and methods that can be used to influence change.

8.3 The role of social norms, fairness and trust in behaviour change and in resistance to change.

8.4 Factors influencing technology diffusion and behaviour change and the uptake of environmental practices by farmers.

8.5 The comparative merits of the different planning regimes in these proceedings for changing human and social behaviour to achieve water quality outcomes for the Manawatu-Wanganui Region (*Region*).

SUMMARY OF EVIDENCE

9 A number of principles underpin the use of policy methods that encourage social and human behaviour change amongst their recipients. I refer to these as "voluntary policy methods". The principles and approaches when applied in a regional plan can be used to encourage willing compliance with both regulatory and non-regulatory methods, reducing the need for and costs of, enforcement and coercion.

10 Voluntary policy methods include decision support tools, financial assistance, negotiation and collaboration, promotion, education, and one-on-one contact, as well as rules designed to achieve social learning.

11 Individuals behave according to their beliefs about social norms, in addition to how they might be affected by instrumental costs and benefits. Social norms influence people because they describe the ways that the individuals and groups that people are involved in expect them to behave. Social norms are used to

define what might be acceptable and unacceptable behaviour, in particular in this case, groups such as dairy farmers.

12 Overseer results for 2010 for 143 existing dairy farms in the Region show an average of 22kg nitrogen loss per hectare and the 75th percentile is at 27kgN/ha (Dr Stewart Ledgard's statement of evidence for Fonterra, at paragraphs 23-25). So most dairy farms on Land Use Capability (*LUC*) class 2 are already below the level of loss being proposed by Ms Clare Barton, planner for the Manawatu-Wanganui Regional Council (*Council*). These results can be used to indicate the distribution of farm practices around a social norm for dairy farm systems in the Manawatu. The results illustrate the range of nitrogen losses that occur throughout the Region including those that might be considered high by many dairy farmers and so appropriate for Council regulation.

13 Developing policies in a cooperative way has been shown to generate partnership arrangements to resolve shared concerns, even though the same people in the same situation can react quite competitively to similar situations presented in an adversarial way.

14 When new practices are introduced to a group of people, it can take a number of years for those practices to diffuse through the population. This delay occurs whether the practice involves a commercial product like a cellular phone or a preventative product such as wearing seat belts in cars. Other preventative technologies that can take a long time to diffuse include environmental management practices, and dairy effluent treatment.

15 The level of adoption of new environmental technologies depends in part upon how suitable they are to adaptation on farms. It also depends upon how well networked farmers are with each other.

16 Farmers do not have to be pro-environmental to adopt environmental practices on their farms. They may do so for practical reasons to make their livestock management easier or to reduce their costs.

17 Farmers (like other people) are motivated to change their behaviour in response to their perceptions about the expectations of people who are important to them. They have been shown to do this even when they have had to compromise the profitability of their businesses to do so.

BEHAVIOUR CHANGE AND POLICY PRINCIPLES AND METHODS TO INFLUENCE CHANGE

Introduction

18 In this evidence, I have used the term "voluntary policy methods" to describe actions that encourage social and human behaviour change by willing participants. This definition does not restrict voluntary policy methods to what the RMA describes as "other methods" or "non-regulatory methods". Voluntary policy methods, according to this definition, include rules that are designed to engender general public support and willing compliance. This area of study has been the focus of my more recent research and it lays the foundation for my evidence.

Policy methods to encourage willing change

19 The principles behind the use of voluntary policy methods provide mutual benefits for recipients and policy agencies, and therefore encourage learning, normative change, and diffusion throughout social groups (Parminter and Ettema 2010).

20 Voluntary policy methods include: decision support tools, financial assistance, negotiation and collaboration, promotion, education and one-on-one direct contact (Parminter 2010[a]). These methods, when supported by industry and community groups, can be incorporated in a collaborative strategy to effectively deliver policy outcomes (Howlett and Ramesh 2003).

21 Using an example from the POP, education as a voluntary policy method is already in use to address soil erosion. Educative field days are being held collaboratively with AgResearch, Regional Council staff, science, industry, farming experts, and hill country farmers.

22 A graph of the distribution of nitrogen losses calculated from Overseer and available for the 2010 period is contained in the evidence of Dr Ledgard (Figure 1, page 6). In the graph, whilst some farmers have very high nitrogen losses, most farmers operate below the likely nitrogen loss standards for the Region's catchments.

Strategies for behaviour change

23 When the social groups intended to be the recipients of policy change are considered in separate segments that reflect their psychological relationship to the desired behaviours, it is possible to select a mix of voluntary policy methods matching those segments, in an effective and efficient strategy to realise measureable policy objectives (Brown and Bewsell 2007). It is the presence of such a strategy linking operational activities with desired behavioural outcomes - that separates policy instruments likely to be effective from those that will have uncertain and unpredictable results (Prochaska and Velicer 1997).

24 A strategic approach to water quality is able to recognise and build on the relationships between rural communities and nearby waterways. For some communities this relationship may be quite strong, particularly where areas of shared recreation are involved (Parminter et al 2007). In such circumstances, information about the state of "their" waterway is, on its own, enough to motivate cooperative behaviour change amongst farmers (ibid).

25 A review of the use of voluntary policy methods by government agencies in New Zealand has identified the importance of a strategic design to guide the selection and adaptation of policy methods to meet the needs of recipients, stakeholders and the government agency involved (Parminter and Ettema 2010).

26 Applications in New Zealand of voluntary policy strategies have shown that they provide:

26.1 A basis for developing working partnerships between landowners, industry and councils to achieve agreed goals (Ostrum 2002).

26.2 Joint participation and shared resources for implementing policies.

26.3 Learning and capability development, not just for farmers but council and industry people as well. Mr Newland for Fonterra outlines in his statement of evidence the role industry has to play in this process.

26.4 Collective monitoring and data-sharing for adaptive management (Stokes et al 1990).

26.5 Support for enforcement activities that constrain the behaviour of individuals operating outside social norms. In a study of effluent practices by dairy farmers, compliant farmers asked for greater enforcement efforts by policy agencies to ensure that farmers operating outside of the required standards would not result in a community back-lash against all dairy farmers (Parminter et al 1999).

SOCIAL NORMS AND BEHAVIOUR CHANGE

Factors influencing behaviour

27 Engagement and consultation with affected parties is an important part of developing provisions for a regional plan. Farmers have shown that their willingness to work together to address environmental issues "*is closely connected with [their] trust in the functioning of organisations and institutions*" (Leeuwis 2003, p74). In New Zealand trust in government institutions has been declining (Barnes and Gill 2000), and turning this around is thought to require greater opportunities

being provided for participation, more transparency and follow through being shown in response to citizen concerns (ibid).

28 People have been shown to care about fairness in social transactions, including fairness of outcomes (Benkler 2011). With outcomes, it is not that people consider that there has to be an equally shared cost or burden, but rather that all the other parties are acting with equal responsibility to address an issue. People will take actions at considerable cost to themselves to attempt to redress apparent unfairness (ibid).

29 People are influenced in their response to introduced policies by whether the policies have been developed cooperatively or in an adversarial way. In research studies, if policies have been developed in a community setting then 70% of people were likely to respond cooperatively (Benkler 2011). This implies that there is a widespread social norm for people to work together rather than pursue their individual interests. However, if policies were introduced in an adversarial setting, then over half of that group of people became quite competitive with each other, leaving a minority to remain cooperative with each other. This suggests that norms for expressing community good above individual good need to be encouraged by policy agencies before they can be relied upon in social change strategies.

30 New Zealand farmers have been highly adaptable and innovative (Pawson and Brooking 2002). Studies have shown farmers to include being self-reliant and their own boss, as important goals for farming (Parminter and Perkins 1997). Regulations that increase farmers' dependence for information and advice upon external agencies and non-farming professionals can reduce farmers' self-esteem (through their self-identity) and confidence in their own decision making (their self-efficacy), both shown to be important in the uptake of new environmental practices (Parminter 2009).

31 Farmers are likely to have less goodwill and willingness to be cooperative if they consider that they are being coerced to use environmental practices. If instead of taking a coercive approach, new policies are developed through mutual understanding, trust and community values, then it is likely that there will be support from the majority of landowners who will continue to make additional investments as they see opportunities to reduce their environmental impact (Benkler 2011).

Social activism and resistance

32 When people consider that policies being introduced contain a certain and immediate threat to their way of life, they can become motivated towards social activism for their self-protection. All people belong to specific social groups as part of their personal and self-identity (Turner et al 1994). When

outside groups challenge concepts fundamental to another social group's identity, they are likely to engender a backlash from that group's members. This can be so, even though only a few members of the group may be materially affected. This can occur when agencies introduce policies that undermine group norms and accepted ways of behaving (Hogg and Abrams 1988).

33 Dairy farming operates under accepted (by farmers) social norms and ways of operating (Paine 1997). If activities considered by farmers to be normal practice become unlawful they may put their efforts into trying to avoid apprehension and punishment rather than modifying their behaviour to be compliant (Watson 2004[b]). Both social activism and punishment avoidance have been associated with legislation marginalising social groups (Fielding et al 2008).

Conclusions on behavioural change

34 It is likely that farmers applying LUC-based nitrogen loss limits (as proposed by Ms Barton for the Council) will find that neighbours with the same farming systems have different loss limits to work towards. These situations have implications for farming costs and farm operations that farmers will generally not have been able to prepare for. It is a problem for the Council's proposed policy on nitrogen leaching that differences should exist in the viability of neighbouring properties without those differences being directly related to the nitrogen cycle. Farmers are likely to feel such a situation to be inequitable and lose confidence in the ability of the regional plan to resolve the issues.

TECHNOLOGY DIFFUSION AND UPTAKE OF ENVIRONMENTAL PRACTICES

35 Diffusion has been shown to depend upon the benefits and costs of new practices, communication channels, the social system, extent of policy interventions and time (Rogers 2003). In general, half of the rate of uptake is explained by characteristics of the practices and the rest by the other factors.

36 Innovations known as preventative practices "*have particularly slow rates of adoption, because individuals have difficulties in perceiving their relative advantages*" (Rogers 2003, p234). Preventative practices have the benefit of reducing the risks of harmful outcomes. The benefits are less tangible to potential users.

37 Two examples are used below to develop these concepts further. One is from commercial innovations and one from regulatory policy:

37.1 Cellular phones are considered to have been an almost ideal technology for people to adopt. Cellular phones are a tangible product with clearly identified advantages for

their users. The Finnish company Nokia are world leaders in cell phone technology and yet it took twenty years from its introduction in 1980 before usage in Finland reached 70% (Rogers 2003).

Other work by Rogers (2003) has shown that the actual decision making time required for each individual within a social network for the period between being confronted with a new practice and fully applying it, can vary between 0.5-5 years. This decision making period depends mainly upon the degree of innovativeness shown by different population segments. If policy interventions for change are intended to reach all the decision makers in a population, this research suggests that a minimum of 5 years is required. Using regulations as a way of speeding up the decision making process can result in unsuccessful implementation unless there are personal support mechanisms provided simultaneously.

37.2 So far in the evidence, only technologies that have a material benefit to potential uses have been considered. However, the benefit of some technologies is that they reduce the risks of harmful outcomes and so the benefits are less tangible to potential users. These are known as "preventative technologies". When the introduction of preventative technologies is examined in New Zealand, these consistently have taken a longer period for adoption, as predicted by Rogers. For example, the wearing of seatbelts was made compulsory in passenger cars in 1975. However, it took a further twenty years (until 1995) before seat belts were being worn by over 85% of front seat passengers (Ministry of Transport 2010).

38 What these examples illustrate is that the effectiveness of regulations to achieve widespread social change is dependent upon realigning social norms as well. The rate of overall social behaviour change is closer to the change in social norms rather than the level of coercion used to achieve compliance (Watson 2004[b]).

The uptake of environmental practices by farmers

39 Not all the environmental practices being developed by research institutions can be applied by farmers to achieve the same results as might be realised under experimental conditions. This is especially so with practices being developed for environmental outcomes because much of the research, by necessity (from the long timescales involved), requires cross-sectional rather than longitudinal studies (Tilman 1989). Uptake therefore requires resources and time to adapt new practices to the range of situations in which they are going to be applied. In a number of studies about the application of environmental policy, this has

been one of the factors first pointed out by farmers to researchers (Botha and Parminter 2006).

40 Uptake of practices (by a social group as compared to individual farmers) is also the result of how well potential farmers are networked together to accumulate the results of their decisions across space and time. If farmers have poor links with each other because of geographic isolation or limited personal contact, it becomes harder for them to pass on to each other any of the things that they may have learnt. Whether or not farmers are well networked, change has been shown to start with innovators and diffuse through society to reach its more conservative decision makers (Rogers 2003).

41 A New Zealand example of an environmental policy introduced in the primary production sector was Zespri's introduction of "kiwigreen" in 1992. Kiwigreen was a voluntary management system designed to reduce the levels of pesticides to which kiwifruit were exposed before harvesting (Morriss et al 1998). These pesticides were the subject of stringent restrictions for the industry to obtain market entry into Europe and North Asia. It took 5 years from introduction before kiwigreen production constituted over 80% of the industry output and it was made mandatory (Shane Max, pers com). A considerable amount of industry effort, incentives and marketing was required for this change to be successfully introduced to the industry, despite its clear advantages for growers who received higher payouts for fruit supplied according to kiwigreen requirements.

42 Zespri waited until about 80% of its growers were using kiwigreen before they made it compulsory for all growers. This strategy enabled Zespri to avoid the grower back-lash that they thought might have occurred if they had introduced compulsion at an early stage and penalised growers before they were able to make the changes themselves.

43 A similar situation existed when speed-cameras were introduced to New Zealand by the (then) Land Transport Safety Authority. Cameras were set to identify the worst 15% of offenders in black-spot areas of the national roading networks.

44 These examples, when viewed against the research in this area, support my view that, when new legislation is intended to impose behaviours outside of the accepted norms for more than 15-20% of society, it is likely to encounter strong resistance.

45 Other illustrations of this are the proposed introduction of a climate-change tax on farmers in 2003 and the proposed compulsory microchipping of all dogs in 2006. In both these cases, a high proportion of farmers and dog owners respectively considered that the proposed legislation was an attack on

"normal practice" and so held protest events until the legislation was modified to minimise the proportion of people affected.

46 A series of studies were undertaken of the factors influencing farmer use of a range of environmental practices including protection of bush remnants, establishment of riparian protection areas through fencing and planting, and preservation of wetlands. No statistical differences were identified between the psychological motivations of dairy farmers and sheep and beef farmers and so they were analysed together. Over 500 farmers participated in each study (Parminter 2009)

47 The findings of these studies included that farmers were motivated to apply environmental practices by:

47.1 Their assessment of the expected benefits from doing so;

47.2 How well the practices fitted with their personal motivation; and

47.3 How much social support they thought they would have.

48 The research that I have reviewed indicates that social change depends upon the type of interactions that occur in farmer networks linking innovative and conservative farmers with the imperatives and resources for making changes. The rate of change is slower with preventative practices that usually do not provide immediate feedback about the benefits of making a change. Trying to speed up the rate of change through regulatory means can be counter-productive and result in greater resistance to change. However, acknowledging and working with the characteristics of a new practice that are recognised by farmers can mean reliable and predictable behaviour change results.

49 Farmers' likelihood of using the environmental practices was not necessarily related to their attitudes towards environmental improvement. Instead, they were motivated by a complex mix of farm system advantages and social dynamics. For example, benefits from riparian planting, such as ease of management and reduced farming system costs, were factors as well as improved waterways and habitat protection.

Conclusions on technology diffusion and uptake of environmental practices

50 The POP rules for existing dairy farmers need to recognise the differences in the ability of those farmers to take up new practices depending upon their being able to adapt them to their farming systems, their resources and their community networks.

51 The regulatory regime proposed in the POP should be supported by an extension strategy, developed with industry agencies, that

assists farmers to understand the expected benefits from various practices and how to implement the practices successfully.

CONCLUSIONS AND COMPARATIVE MERITS ASSESSMENT

Conclusions

52 The extent to which the majority of farmers are motivated to change their behaviour or maintain the existing practices desired by the Council, will be a large determinant for the POP successfully achieving its objectives.

53 Voluntary policy methods involving regulatory and non-regulatory methods can be combined and should be designed to address farmers' core decision-making beliefs and encourage learning and innovation so that farmers keep applying new technologies to improve water quality.

54 The process for developing policies and the degree of collaboration achieved with community and industry agencies during their development and implementation is important for motivating ongoing stakeholder compliance and trust in the administrating regulatory body.

55 In my view, reflecting the results of a number of examples, rules based on addressing the behaviour of the worst 20% of performers are likely to be the most effective (an '80:20' approach). Such rules are likely to align with acceptable social norms and so receive social support.

56 Any rules requiring the adoption of new technologies that must be customised to fit each farmers' farming system need to recognise the diverse range of factors influencing each farmer's ability, their motivations for making changes and their social networks into the community around them.

57 Social change takes time and the level of progress already achieved in the farming community in the Region needs to be recognised. Introducing coercive rules at this stage could slow that rate of progress down.

58 Rules that seek to coerce those already operating within acceptable social norms or which require the adoption of new technologies and practices before their consequences upon farming systems are fully understood, will have uncertain and unpredictable results and reduced effectiveness. Outcomes may include farmers acting to avoid apprehension and punishment rather than modifying their behaviour to achieve desired outcomes. Farmers' trust in the regulatory body is also likely to be undermined through the adoption of such rules.

Assessment of the different approaches

59 The Notified Version of the POP had the advantages of being very comprehensive, covering most agricultural sectors and of giving farmers an extended length of time to achieve nitrogen targets. The disadvantage is that it took a very prescriptive approach and imposed high costs on farmers that were already operating inside the Council's targets.

60 In my opinion, the Decisions Version of the POP is more flexible. It enables individual farmers to concentrate on using their own resources efficiently and the Council staff to manage the overall impact upon catchments. The Decisions Version still requires the Council to take a prescriptive approach in determining what practices a farmer must use without having complete information (human and biophysical) to guide them. Overall, the Decisions Version better reflects the principles of a voluntary policy method than the Notified Version of POP. Therefore, it is likely to achieve greater and quicker uptake in terms of changing behaviour and achieving the POP's water quality objectives.

61 The Council's version of the POP as proposed by Ms Barton, whilst based upon the Decisions Version, appears to have reinstated some elements of the original Notified Version.

62 This version goes some way towards simplifying the LUC table and setting nitrogen loss targets for individual farms instead of prescribing the management practices to be used. In principle, this has the potential to encourage farmers to learn from their experience and to be innovative. However, the use of LUC adds a complication to the POP that Dr Ledgard considers to be unnecessary for the effective implementation of nitrogen loss-reduction technologies and practices. Anything that adds to the complexity of technology introduction and diffusion is likely to slow its uptake and encourage resistance.

63 Time is needed for farmers to learn from their experience and from each other about the most appropriate mix of practices and how they can be most effectively deployed on their properties. The 70-80% of farmers operating within social norms can work with industry leaders to utilise new technologies and make continuous improvements.

64 To be consistent with voluntary policy principles, enforcement of rules by Regional Council staff should follow working with industry to achieve willing compliance. This may involve providing technical and financial support to address and overcome any on-farm competency and capacity limitations. Applying rules in this way, as an imperative for education, harnesses existing social networks and provides models for farmers likely to find themselves in similar situations. This approach would take into account the normative behaviour of

farmers, build community support in the Region and lower the overall costs of enforcement.

Terry Parminter
18 March 2012

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