

IN THE ENVIRONMENT COURT AT WELLINGTON

IN THE MATTER of the Resource Management Act 1991
 (“**the Act**”)

AND

IN THE MATTER of clause 14 of the First Schedule of the
 Act

BETWEEN **FEDERATED FARMERS OF NEW ZEALAND**

ENV-2010-WLG-000148

AND

MERIDIAN ENERGY LTD

ENV-2010-WLG-000149

AND

MINISTER OF CONSERVATION

ENV-2010-WLG-000150

AND

PROPERTY RIGHTS IN NEW ZEALAND

ENV-2010-WLG-000152

AND

HORTICULTURE NEW ZEALAND

ENV-2010-WLG-000155

AND

WELLINGTON FISH & GAME COUNCIL

ENV-2010-WLG-000157

Appellants

AND

**MANAWATU-WANGANUI REGIONAL
 COUNCIL**

Respondent

**REBUTTAL EVIDENCE OF ANDREW JOHN BARBER FOR HORTICULTURE NEW
 ZEALAND IN RELATION TO THE APPEALS ON THE PROPOSED ONE PLAN FOR
 MANAWATU WANGANUI REGIONAL COUNCIL ON SUSTAINABLE LAND
 USE/ACCELERATED EROSION**

2 APRIL 2012



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QUALIFICATIONS AND EXPERIENCE

1. My name is Andrew John Barber and I prepared a statement of evidence in chief dated 17 February 2012 which sets out my qualifications and experience and confirms that I will comply with The Code of Conduct for Expert Witnesses contained in the Environment Court's Consolidated Practice Note dated 1 November 2011. I reaffirm that that information and confirmation applies to this rebuttal evidence

SCOPE OF REBUTTAL EVIDENCE

2. This statement of rebuttal evidence addresses the following matters:
 - (a) The permitted activity rule conditions – the use of Codes of Practice and/or the Schedule D numeric standard and whether Codes of Practice can or should meet Schedule D standards;
 - (b) Should the setbacks or riparian buffers be 5m or 10m;
 - (c) Ancillary activities in any setback;
 - (d) The best approach to minimising soil erosion and sediment loss.
3. I note that there is a close interrelationship between the topic of Sustainable Land Use and Accelerated Erosion (which this rebuttal evidence is in relation to) and the Surface Water Quality topic. Much of the information in this statement therefore restates and repeats what I included in my evidence in chief on Surface Water Quality.

CODE OF PRACTICE AND SCHEDULE D STANDARDS

4. In my evidence in chief on Sustainable Land Use/Accelerated Erosion I explained the Code of Practice for Commercial Vegetable Growing in the Horizons Region and attached a copy of the Code as an Appendix.
5. In relation to the inclusion of sediment numeric in Schedule D it is my opinion that the implementation of the Code of Practice will not provide certainty that the water quality outcomes intended by Schedule D will be consistently achieved. However this is no different to what can be claimed for Whole Farm Plans or other erosion and sediment control guidelines, and Code of Practices.

6. The reason that it cannot be stated categorically that the measures in the Code of Practice will always meet the Schedule D standards is that events and circumstances could conspire over which there is no control. Equally there is no research linking erosion and sediment control measures and water quality. However requiring best practice is the most appropriate and effective mechanism to ensure that sediment loss is minimised and provides the best protection for water quality.
7. I have not seen any evidence linking Whole Farm Plans and water quality or sediment discharge levels. From a comment at the Technical Caucusing I understand that they are designed to reduce erosion by 70%. By that standard the Code of Practice can demonstrate comparable results (see paragraph 9).
8. This, however, is not the same as directly linking good management practices and specific water quality standards. Therefore like the two guidelines that I have reviewed (Erosion and Sediment Control Guidelines for the Wellington Region and Auckland's TP90) it cannot be stated that either of these provide certainty that water quality outcomes intended by Schedule D will be consistently achieved.
9. Wheel track ripping has been shown in the Franklin Sustainability Project to reduce erosion in certain circumstances by 1800% (21 to 1 t/ha). Likewise the majority of erosion in Pukekohe during a major storm on the 21st January 1999 could have been prevented by correctly sized culverts and drains. This has been the case since this stormwater network was upgraded. Both these measures are advocated in the Code of Practice where problems are identified.
10. The Vegetable Code of Practice has been developed based on current scientific knowledge and will be updated as more research and experience becomes available. The FSP Soil and Drainage Management Guide that is referenced and linked in the Code of Practice was developed with the assistance of Les Basher and Craig Ross (Landcare Research), Brian Handyside (Erosion Management), Mike McConnell (McConnell Consultancy) and Steve Bryant (Bryant Environmental Solutions). These are people with many decades of combined erosion and sediment control experience.

11. The sediment trap measures advocated in the Vegetable COP, which includes paddock bunding, have been sized to detain the runoff long enough to allow most sediment to drop out of suspension. The capacity dimensions are based on current scientific knowledge and take into account infiltration rates and soil type. It also needs to be recognised that in the predominantly flat to gentle topography (slope class A 0 - 3 degrees) that most vegetable operations in the Horizons Region operate on, infiltration rates are very high (low run-off) and bunding along headlands creates large sediment trap capacities. Combined with other in-paddock erosion control measures these result in very low stormwater and sediment discharge rates.

RIPARIAN 5 METRE OR 10 METRE BUFFER

12. Mr Hindrup¹ states that the use of a 5 metre riparian margin around rivers is necessary to reduce sediment. While I agree that cultivation should not occur within 5 metres of a river other ancillary structures and activities like bunds and benched headlands could occur within this 5 metre zone and result in a better outcome than simply requiring a mandatory 5 metre riparian buffer.
13. My suggestion would be to have a 5 metre riparian buffer unless other more effective sediment control measures are used. There needs to be the flexibility to adopt the most appropriate control measures and not have it stipulated in regulation. The paddock assessment, which is the first stage in the Code of Practice, will lead to different tools depending on the circumstances. Vegetated riparian margins are described amongst a suite of control measures.
14. On cultivated land, water runoff is channelised which will flow through riparian margins. Mr Hindrup² points to the evidence of Dr Quinn to justify the 5 metre riparian zone where research shows sediment trapping efficiency of at least 80% for all riparian margins of greater than approximately 5 metres. This is based on the conclusion in a review by Yuan et al., (2009) on the effectiveness of vegetated buffers on sediment trapping in agricultural areas. However most of the cited research in this review does not relate to cultivated agriculture. Where it does

¹ Paragraph 129, page 36 in his evidence

² Paragraphs 148, 149 and 150, page 42.

the Fasching and Bauder (2001) trial used sheet erosion and stated that the results were most likely better than in actual field conditions. Mankin et al., (2007) showed 98% reduction in sediment, however greater than 75% of the sediment removal was due to infiltration alone. This will not be the case in practice where flows are channelised. Blanco-Canqui et al., (2004) found a 90% reduction in sediment after an 8 metre vegetated filter strip. In the treatments that used a 0.7 metre wide switchgrass barrier 91% of the sediment was trapped in front of the treatment. The barrier was the most significant measure, not the vegetated land that followed.

15. In my opinion rather than supporting a blanket 5 metre riparian buffer these results show that riparian buffers are unlikely to be effective at minimising sediment entering water in actual field conditions. Other measures such as bunding (barriers) may be more effective and will result in less productive land being lost.
16. Increasing the buffer width from 5 metres to 10 metres will do nothing to reduce sediment loss on cultivated land with channelised flows.
17. This position is consistent with the Record of Further Technical Conferencing (in relation to land use) (March 2012) that in the case of channelised flow, as occurs on cultivated land, that riparian buffers can be ineffective and that other methods would need to be used (Question 18). These other methods include, but are not limited to, bunds and benched headlands (Question 19).

ACTIVITIES IN THE 5 METRE BUFFER ZONE

18. It has been shown that various sediment control measures, such as bunding and benched headlands, can be extremely effective in minimising sediment loss from a paddock. Where these measures are in place stormwater does not flow across an imposed buffer zone, making it superfluous to minimising sediment loss.
19. Therefore it makes sense to have a 5 metre riparian buffer or other more appropriate and effective sediment control measures.

RECOMMENDED APPROACH

20. It is the development of codes of practice which is critical to achieving the desired outcome of minimising soil erosion and

sediment loss from cultivated horticulture. This approach is supported by Policy 5-5:

Supporting codes of practice, standards, guidelines, environmental management plans and providing information on best management practices.

21. As demonstrated through FSP, and advocated by Policy 5-5, codes of practice jointly engage land owners, researchers and council in problem recognition and solution development. It is this process of all stakeholders learning together that not only results in solution development but also ensures ownership of the solution and subsequent implementation.

22. I have read the evidence of Mr Norm Ngapo (on land use) (17th February 2012) in relation to the use of Whole Farm Plans and Codes of Practice and I agree with his comments that³:

One of the most successful ways to achieve sustainable land management in a farm situation is to adopt appropriate soil conservation measures as set out in a Whole Farm Plan or similar type of plan developed specifically for that property.

23. Specifically addressing cultivation Mr Ngapo states that⁴:

If cultivation is undertaken on classes 1 to 4 following normal best practice on slopes up to 20 degrees, and adhering to appropriate setback distances [this issue is addressed in the section above - RIPARIAN 5 METRE OR 10 METRE BUFFER], then I believe it could be permitted subject to robust conditions.

24. As Mr Ngapo points out in his evidence Whole Farm Plans are effectively a Code of Practice⁵ and "*as such it provides a suite of best practice options in one package, tailored to the property, and developed in close liaison with the landowner*". In my opinion, the Vegetable Code of Practice and Whole Farm Plans should be treated the same way by Council as permitted activities.

25. I believe that better environmental outcomes will be achieved through the Code of Practice for Commercial Vegetable Growing than through regulations and enforcement to a set of

³ Paragraph 37

⁴ Paragraph 83

⁵ Paragraph 40

water quality standards. The Code of Practice applies across all growers, whereas the adherence to water quality standard, if it could be attributed to an individual operation, will only directly affect a small subset of growers who could be directly linked to the named rivers in Schedule D.

A J Barber

2nd April 2012