

HEARING PRESENTATION TO PANEL ON PC1 ON 13 MARCH 2019
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I thank the Panel for giving me this opportunity to elaborate further on the material contained in my submission of 4 January 2017, and its accompanying article and poem.

In the last two years I have attended numerous meetings held by Waikato Federated Farmers Executive, and dairy and sheep and beef farmers, and am well aware of the opposition to the changes so far proposed for cleaning up the two Rivers. In all of these the focus has been on the four contaminants, particularly nitrogen levels.

What has never been talked about is the condition of the soils surrounding those rivers, and the implications of this for all of the contaminants – nitrogen leaching, phosphorus runoff, erosion and sedimentation, and E.coli. The efforts to retain the status quo of current chemical farming methods has been overwhelming.

In November 2010 a staff submission on the then proposed Waikato Regional Policy Statement contained a section on soils (14, p.55) stating that 'Policy 14.1 seeks to maintain or enhance the value of soils' and a suggested amendment, 'retain soil versatility to protect the existing and foreseeable range of uses of the soil'. Since then I have not been aware that soil and its condition was ever considered as part of the problem leading to the pollution of the rivers and PC1.

There are few true soil scientists left in New Zealand, and the impact of both commercial and research science, and its accompanying funding, appears to have blotted out the fact that millions of years of the activities of soil life is what has kept the animals and plants of the Earth going. Soil is not 'dirt', nor is it just a series of chemical processes, which can be replicated by man. Instead it is the amazing microbiome of soil inhabitants, working in harmony, which hold the rain that falls, feed each other, and provide all plant life with the minerals needed in plant available forms.

And the chemicals which we have been spreading, in ever greater quantities, have been killing off this microbiome since the mid-1980's, when Maui gas allowed us to make urea. The demand for this product has long exceeded what we can produce, and the depletion of the Maui field will aggravate this. So, we import, at great expense, many shiploads of both urea and phosphate, in the latter process putting half a million desert residents into refugee camps. In the 1980's we used 55,000 tonnes of urea, and last year around 700,000 tonnes. I do not believe that New Zealand's land area has expanded twelvefold in 40 years.

At the same time, although not admitted by those who should know, our pasture production has been quietly reducing. Whereas MAF figures showed that in the 1980's the average farm produced between 15 and 18 tonnes of dry matter per year across the Waikato, the figure quoted these days is 12 to 15 tonnes, with the balance of feed being provided by the increasing tonnages of such supplements as PKE.

While most of the chemicals being spread are only taken up by plants to a level of about 40%, the remainder simply leaches away. The water holding capacity of our soils has also

been considerably reduced, so that root depths have shrunk, and the longer periods of dry weather which are part of the climate today result in minimal pasture growth to feed a greatly increased population of supposedly productive beasts.

Another effect on our soils has been the potential to increase erosion, again through the loss of soil life to stick its particles together. And a diet of high nitrate pasture has been unkind to cattle rumen, resulting in urine being overloaded with nitrogen, which has set them up as being the main causes of our problems.

The process of PC1 began in 2010, and came to a supposed conclusion at the end of 2016. A further two years of argument has got us no further. In the interim, in places like the original Dust Bowl in the USA, enlightened farmers have discovered regenerative farming, and are building their formerly impoverished soils at a great rate, and doubling their production.

As a country which relies on agriculture for most of its income, and its Clean and Green image to continue to attract customers, why aren't we noticing what is happening elsewhere and seeing if it would work for us?

Regenerative farming relies on no ploughing, and there is a certain amount of no-till happening here. But also on multi-species cover crops, compost, manure, the miracles of humus, leading to the continuous encouragement of the myriad components of soil life – in short, what Nature has been doing for millions of years. It's very much cheaper, and it works.

It has been discovered in New Zealand but, when James Bailey the sheep and beef representative on the CSG, attempted to introduce it to that group, those only interested in the status quo forbade it to be discussed at all.

The suggested timeframe for PC1 is 80 years, with supposed continual reductions in pollutants. At the same time we are feeling the effects of climate change, reduced pasture production, and largely imaginary farm profitability. With agricultural debt reportedly now \$49b, we are also becoming an international embarrassment.

I therefore urge the panel to look at regenerative farming as a possible solution to our water quality problems, rather than the imaginary technology which doesn't yet exist and probably won't work. I understand that Landcare Research are currently seeking funding for a national research programme to be carried out over 5 years on the potential for regenerative farming across New Zealand, including its various climates and soils. That's a whole lot shorter than 80 years!