

**IN THE HIGH COURT OF NEW ZEALAND  
NEW PLYMOUTH REGISTRY**

**CIV 2013-443-107**

**UNDER** the Judicature Amendment Act 1972 and the  
Declaratory Judgments Act 1908

**IN THE MATTER** of an application for judicial review and an  
application for a declaration

**BETWEEN** **NEW HEALTH NEW ZEALAND INC**

**Plaintiff**

**AND** **SOUTH TARANAKI DISTRICT COUNCIL**

**Defendant**

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**AFFIDAVIT OF MARTIN MITCHELL FERGUSON**  
Dated 19 August 2013

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I, Martin Mitchell Ferguson, Professor Emeritus of Dunedin affirm:

*Introduction and qualifications*

1. I am a Professor Emeritus (Dentistry) at Otago University.
2. My qualifications are BSc (Hons) (1966), MBChB (1968), BDS (1972), FDSRCPS (Fellowship in Dental Surgery, Royal College of Physicians and Surgeons of Glasgow) (1977), FRMS (Fellow of the Royal Microscopical Society) (1966), ONZM for services to dentistry and palliative care (2007).
3. I have held numerous academic positions including the following positions:
  - 3.1. Nuffield Scholar 1969 – 1972
  - 3.2. Visiting Associate Professor in Oral Pathology, University of Illinois 1972 – 1974
  - 3.3. Visiting Associate Professor in Oral Pathology, University of Illinois 1972 – 1974
  - 3.4. Nuffield Research Fellow 1974 – 1975
  - 3.5. Senior Lecturer in Oral Medicine and Pathology. Glasgow University
  - 3.6. Professor of Oral Medicine and Oral Surgery. University of Otago 1986 – 2007
  - 3.7. Visiting Professor University of Strasbourg



- 3.8. Visiting Professor University of Bangladesh
- 3.9. Examiner – Royal College of Physicians and Surgeons of Glasgow, Royal Australasian College of Dentists, University of Melbourne, University of Malaya.
4. I have also published extensively in scientific journals and presented numerous papers both nationally and internationally.

*Expert opinion*

5. I have been asked by the plaintiff to give an opinion on whether fluoridation could be considered a medicine.
6. I have read, understood, and agree to comply with the Code of Conduct for expert witnesses. The question at issue is within my area of expertise based on my background in dentistry, biochemistry, pharmacology and clinical practice.
7. I am providing this opinion solely to assist the Court.
8. I wish to record that I have not been paid to prepare this opinion and have provided it on a pro bono basis.

*Fluorine*

9. Fluorine (atomic number 9) is a member of Group VIIA in the Periodic Table of elements; the Halogens. The other members are chlorine, bromine, iodine and astatine.
10. Fluorine is a pale yellow gas and is the most reactive of all the elements.
11. Fluorine is widely distributed with other minerals in the environment, occurring principally in fluorspar ( $\text{CaF}_2$ ) and cryolite ( $\text{Na}_2\text{AlF}_6$ ).
12. Fluoride has a number of industrial uses, including hydrofluoric acid production, aluminium smelting and steel production. In medicine, it is

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- used for the reduction of dental caries as well, sometimes, as a treatment for osteoporosis.
13. Bone and tooth enamel matrix consist largely of hydroxyapatite ( $\text{Ca}_5(\text{PO}_4)_3(\text{OH})$ ). This imparts rigidity. Fluoride can replace the hydroxyl (OH) group, which results in a change in the crystal morphology and becomes more resistant to acid dissolution. Accordingly, fluoride has been used therapeutically as a measure to reduce the incidence of caries. This has taken the form of fluoride-containing dentifrices, tablets for children as well as fluoridation of water supplies.
  14. The present question is should fluoride be regarded as a medicine.
  15. The standard definitions of a medicine are in agreement; a substance used to treat or prevent a disease.
    - 15.1 "Drug or other preparation for the treatment or prevention of disease" *Oxford Dictionary*
    - 15.2 "A substance or preparation used in treating disease" *Merriam-Webster Dictionary*.
  16. This is in contrast to a supplement which is defined as follows:
    - 16.1 "A substance taken to remedy the deficiencies in a person's diet" *Oxford Dictionary*
    - 16.2 "A product taken orally that contains one or more ingredients (as vitamins or amino acids) that are intended to supplement one's diet and are not considered food" *Merriam-Webster Dictionary*.
  17. While topical or systemic fluoride has been shown to have some effect in reducing dental caries, there is no disorder recognised that is due to a deficiency of fluoride. Therefore it cannot be classified as a supplement.
  18. In my opinion dental caries is a disease.
  19. Disease is defined in the Oxford Dictionary as

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“a disorder of structure or function in a human, animal, or plant, especially one that produces specific symptoms or that affects a specific location and is not simply a direct result of physical injury”.

20. In the Merriam Webster Dictionary disease is defined as

“An impairment of the normal state of the living animal or plant body or one of its parts that interrupts or modifies the performance of the vital functions, is typically manifested by distinguishing signs and symptoms and is a response to environmental factors (as malnutrition, industrial hazards, or climate), to specific infective agents (as worms, bacteria, or viruses), to inherent defects of the organism (as genetic anomalies), or to combinations of these factors”.

21. There is substantial scientific and clinical literature that describes dental caries as a disease. For example:

21.1. *Dental caries: a dynamic disease process*, Featherstone JD, Aust Dent J 2008 Sep; 53(3):286-91

21.2. *Dental caries: an infectious and transmissible disease*, Caufield PW, Li Y, Dasanayake A, Compen Contin Educ Dent 2005 May 26(5 Suppl 1) 10-6

21.3. *Enamel hypoplasia and dental caries in Australian aboriginal children: prevalence and correlation between the two diseases*, Pascoe L, Seow WK, Pediatr Cent 1994 May-Jun 16(3): 193-9

22. Water supplies do have various chemicals added to ensure hygiene and potability, for example chlorine. The process of purification involves removal of contaminants from untreated water in order to be acceptable for human consumption. Substances that are removed during the process of drinking water treatment include suspended solids, bacteria, algae, viruses, fungi, minerals such as iron, manganese and sulphur, and other chemical pollutants such as fertilisers.

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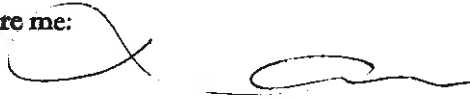
- 23. However, these agents are not added as medicines or supplements and are considered to be essential for potability.
- 24. My conclusion is that water fluoridation can be regarded as the use of a medicine.

**AFFIRMED** at Dunedin this 18<sup>th</sup>)

day of August 2013



before me:



Melanie Naulls

A Barrister and Solicitor of the High Court of New Zealand

