

UNDER the Resource Management Act 1991 ("**RMA**")
IN THE MATTER of Proposed Plan Change 91 ("**PC91**):
Hazardous Substances to the Whāngarei
District Plan

**STATEMENT OF EVIDENCE OF JEFFERY JOHN GARNHAM ON BEHALF OF NGĀ TAI
ORA**

PUBLIC HEALTH

2 March 2023

1. SUMMARY OF EVIDENCE

- 1.1 A precautionary approach needs to be taken to the management of the use, storage and disposal of hazardous substances in the Whangārei District. This is necessary to ensure that sensitive areas such as residential areas and schools are given the best protection, from the risks associated with hazardous substances be it toxicological, chemical, fire or explosion.
- 1.2 PC91 is reliant on the use of the existing zone-based provisions. Given the significant gaps identified in the evidence of Mr Badham, this approach must be regarded as incomplete and inadequate. It is important, that there are clear rule requirements within the Whangārei District Plan to address residual risk, to ensure that exposure is minimised, particularly with regard to vulnerable groups such as children, high risk groups and high deprivation populations.

2. INTRODUCTION

- 2.1 My full name is Jeffrey John Garnham. I am a Health Protection Officer with Te Whatu Ora – Health New Zealand as part of the Ta Tai Tokerau Northern Nga tai Ora Public Health Northland. Prior to the health reforms we were Northland District Health Board Public Health Unit reporting to the Ministry of Health. I am based in Kerikeri but undertake my work throughout Northland.
- 2.2 I am a qualified as a Health Protection Officer having a New Zealand Certificate in Science (Chemistry), National Diploma in Environmental Health Science, National Diploma in Drinking Water Assessment. I have over 30 years' experience as a Health Protection Officer. During this time, I have been employed in various roles as an

Environmental Health Officer (via contract) Far North District Council, Drinking Water Assessor, Warranted Biosecurity Officer, Hazardous Substances Enforcement Officer, with the overarching function of a Health Protection Officer including experience with:

- (a) Processing applications for permission for the use of Control Substances under Section 95A of the Hazardous Substances and New Organisms Act 1996 (“**HSNO**”) (primarily cyanide and 1080 based toxins), assessing whether there is a public health risk and setting appropriate permission conditions.
- (b) Approval and auditing of Food Safety Plans and Water Safety Plans.
- (c) Submitting on Resource Management Act 1991 (“**RMA**”) plan changes and consents. These have ranged from regional plans and district plan changes through to subdivision and land use resource consents, with the latter being primarily in the Far North District.
- (d) Responding to public enquires and complaints where there are concerns relating to public health matters. These are diverse and include matters relating to hazardous substances, often involving incompatible activities and sensitive, vulnerable populations.
- (e) I have undertaken extensive work in compliance, monitoring and enforcement, using a wide range of diverse legislation such as the Health Act 1956 and its regulations, the Food Act 2014, RMA (in particular Sections 16 and 326)
- (f) I am member of Te Whatu Ora National Public Health Service (previously the Ministry of Health) Hazardous Substance Focus Group from its inception 18 months ago. The focus group is currently in abeyance due to the national health reforms.

2.3 I attach a copy of my CV in **Attachment 1** which provides further detail on my experience and expertise.

2.4 This evidence is in respect of a submission by Ngā Tai Ora Public Health Northland (“**Ngā Tai Ora**”) on Whangārei District Council’s (“**Council**”) Plan Change 91: Hazardous Substances (“**PC91**”). PC91 proposes to remove all rules in the Whangārei District Plan (“**WDP**”) relating to hazardous substances. A new set of objectives and policies are included in a new Hazardous Substances (“**HAZ Chapter**”), with reliance placed on existing provisions in the WDP to capture the consideration of these new objectives and policies.

2.5 My evidence will address the following topics:

- (a) Involvement with PC91;
- (b) Sensitive and vulnerable populations and residual risk;
- (c) Public health principles (precautionary approach); and
- (d) Hazardous Substances and Public Health Risk.

2.6 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in preparing this statement of evidence. Unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express. I have no conflict of interest to declare with respect of PC91.

3. INVOLVEMENT WITH PC91

3.1 To date, I have been involved in preparing the following documents related to PC91 on behalf of Ngā Tai Ora:

- (a) Original submission – Council reference #5 – see Appendix 5 of Council’s Section 42A Report (“**s42A**”) prepared by Council’s Reporting Planner Taya Baxter; and
- (b) Further submission – Council reference X010 – see Appendix 5 of the s42A.

3.2 Ngā Tai Ora have also commissioned David Badham to provide independent planning evidence. I confirm that I have reviewed Mr Badham’s evidence in the preparation of my statement of evidence.

4. SENSITIVE AND VULNERABLE POPULATIONS AND RESIDUAL RISK

4.1 The Ministry of Health’s New Zealand Health Survey (“**NZHS**”) provides information of the health and wellbeing of New Zealanders regularly on an annual basis.¹ The following are some key points that I wish to highlight regard to the NZHS:

¹ Ministry of Health, New Zealand Health Survey 2021-2022 Ministry of Health: Wellington.

- (a) The 2021/2022 Annual Results showed that adults living in the most socioeconomically deprived areas were 1.7 times as likely as those living in the least deprived areas to not have visited a GP due to cost.² Further, the NZHS also showed that 15% of Māori adults had not accessed primary health care (General Practitioner) due to cost and Māori adults were 1.3 times as likely as non-Māori adults to not visit a GP due to cost, after adjusting for age and gender. People living in lower socio-economic areas were 2.9 times less likely to have collected a pharmacy prescription due to cost as adults living in the least deprived areas.
- (b) In general, people who live in more deprived areas are more vulnerable to environmental-related health risks. They are also more likely to have less capacity to cope with the effects of environmental risks, and fewer resources to protect themselves from environmental hazards.³
- (c) In my opinion, residual risk should consider the nature of the actual or potential exposed population, particularly when a sensitive activity involving high deprivation or vulnerable population. In these circumstances the residual risk should be considered to be higher due to the increased likelihood of adverse effects and outcomes to any actual or potential exposure which are likely to be exasperated further by their inability to respond or cope with the effects. As can be seen in (a) above where a medical advice may not be sort meaning adverse effect will remain untreated and, in all likelihood, undetected.

4.2 **Attachment 2** contains 4 maps showing vulnerable populations overlaid against a portion of the WDP zone maps with an accompanying deprivation index of the same area. As can be seen from the maps, areas with high deprivation index areas / vulnerable populations in Raumanga and Morningside tend to be located on the boundaries with areas with industrial activities. These maps and the relevance to PC91, are discussed in greater depth in section 6 below.

² Ministry of Health, Annual Data Explorer 2019/20: New Zealand Health Survey [Data File]. 2020, Ministry of Health: Wellington.

³ Massey University - Centre for Public Health Research. Environmental Health Indicators New Zealand - Socioeconomic deprivation profile. [cited 2021 11 Jan]; Available from: <https://ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/>

5. PUBLIC HEALTH PRINCIPLES (PRECAUTIONARY APPROACH)

5.1 The World Health Organisation defines health “as a state of complete, physical, mental and social well-being and not the mere absence of disease or infirmity.”⁴

5.2 The precautionary approach has been defined as:

*“Public health is inherently about identifying and avoiding risks to the health of populations as well as in identifying and implementing positive interventions to improve population health. However, traditional public health interventions have generally focused on removing hazards that have already been identified. In contrast, the precautionary principle states that action should be taken to prevent harm even if some cause-and-effect relationships are not fully established scientifically.”*⁵

5.3 In my opinion, a precautionary approach is appropriate when there is credible evidence that a specific technology or activity might be harmful, especially if the nature of that harm is not fully understood.

5.4 From reviewing the s42A and Mr Badham’s evidence, I understand that PC91 proposes to remove existing rules in the WDP relating to use, storage and disposal of hazardous substances within the Whangārei District. Council is instead proposing to rely on existing activity-based provisions in the Zone chapters in the WDP to manage reverse sensitivity and incompatible land use activities. From a public health perspective, I consider that any deregulation of hazardous substances management should be done using the precautionary approach. This is because the public health effects of hazardous substances can be significant, irreversible, and are not fully known. I address public health risk associated with hazardous substances further below.

⁴ Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. <https://www.who.int/about/governance/constitution>

⁵ Martuzzi, Marco, Tickner, Joel A. & World Health Organization. Regional Office for Europe. (2004). The precautionary principle: protecting public health, the environment and the future of our children. World Health Organization. Regional Office for Europe. <https://apps.who.int/iris/handle/10665/346211>

6. HAZARDOUS SUBSTANCES AND PUBLIC HEALTH RISK

- 6.1 Environmental Protection Agency (“EPA”) approvals and the controls are only as good as the available data and evidence. A review can result in more stringent controls being put in place, or in some instances, the banning of the substance being reviewed due to emerging evidence on their potential or actual harm.
- 6.2 Currently EPA is reviewing Hicane, an agrichemical predominantly used in the Kiwifruit industry with the review instigated by a concerned member of the public submitting overseas research indicating potential health effects.⁶
- 6.3 A Berkeley University study⁷ started in 1999 identified that pesticides and other environmental exposures were potentially impacting on the health of pregnant women and children. Due to this, in 2017 regulations were put in place restricting the application of pesticides within 400 metres of schools between 6am and 6pm.⁷ In my opinion, the circumstances that have occurred are far from ideal for all parties, and in all probability, affect the wellbeing of the community as defined under the RMA, and the state of wellbeing as in the definition of health in paragraph 5.1 above.
- 6.4 In my opinion, these examples reinforce that there is a need for adequate provisions in the WDP to ensure the appropriate separation of incompatible activities and avoidance of reverse sensitivity effects, with sufficient provision to accommodate potential changes in controls.
- 6.5 During the 1990’s, in my previous role with the Northland District Health Board, I submitted on a number of applications for subdivision in the Kerikeri area which were in close proximity, or indeed amongst, horticultural blocks, primarily Kiwifruit. The rationale in the applications were that HSNO Growsafe controls would prevent any issues of reverse sensitivity and incompatible activities. In my opinion, it did not and there have been ongoing concerns expressed over the use of sprays in Kerikeri.

⁶ Hydrogen cyanamide reassessment <https://www.epa.govt.nz/public-consultations/in-progress/hydrogen-cyanamide-reassessment/>

⁷ Will buffer zones around schools in agricultural areas be adequate to protect children from the potential adverse effects of pesticide exposure? Robert B. Gunier, Asa Bradman, Kim G. Harley, Brenda Eskenaz <https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2004741>

- 6.6 There are further complexities when there is exposure to multiple hazardous substances as may occur on a daily basis. The complexities are in the form of synergistic, additive effects, individual variations, pre-existing conditions, and population vulnerability.⁸ These are all factors that are not necessarily accounted for in EPA approvals or controls, particular the demographic location and vulnerability of populations in a district.
- 6.7 Multiple exposure is not isolated to other countries, a 2022 Study in pesticide Exposure in New Zealand school aged children showed they had relatively high exposures of chlorpyrifos/triclopyr and pyrethroids, factors associated with exposure were age, season, area of residence, diet, in-home pest control, and pets.⁹
- 6.8 The vulnerable population mapping was used to produce the maps in **Attachment 2**. Vulnerable population mapping was developed by Te Whatu Ora Te Tai Tokerau's Incident Management Team for use in assessing the impact of Cyclone Gabrielle on Northland and is based on data from Environmental Intelligence New Zealand (**EHINZ**) vulnerability index matrix.¹⁰ Highly vulnerable populations are defined as a population at risk that has been exposed to an environmental hazard that they have insufficient resources to prepare or cope with. These hazards can include natural hazards such as drought, flooding, earthquakes, volcanoes, tsunamis, events related to climate change such as wildfires and rises in sea level, as well as air pollution, water pollution, infectious disease and other environmental hazards.
- 6.9 Understanding population vulnerability is important to ensure that the needs of vulnerable population groups are considered in the planning process. This enables environmental hazards to be prevented where possible, or, if not possible, their impact

⁸ Will buffer zones around schools in agricultural areas be adequate to protect children from the potential adverse effects of pesticide exposure? Robert B. Gunier, Asa Bradman, Kim G. Harley, Brenda Eskenaz <https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2004741>

⁹ Li Y, Wang X, Feary McKenzie J, 't Mannetje A, Cheng S, He C, Leathem J, Pearce N, Sunyer J, Eskenazi B, Yeh R, Aylward LL, Donovan G, Mueller JF, Douwes J. Pesticide exposure in New Zealand school-aged children: Urinary concentrations of biomarkers and assessment of determinants. *Environ Int.* 2022 May;163:107206. doi: 10.1016/j.envint.2022.107206. Epub 2022 Apr 5. PMID: 35395578. <https://pubmed.ncbi.nlm.nih.gov/35395578/>

¹⁰ Population vulnerability Taupori whakaraerae <https://www.ehinz.ac.nz/indicators/population-vulnerability/>

can be minimised. Identifying vulnerability also shows where rules are best directed more effectively to protect those who are:

- (a) more exposed to environmental hazards.
- (b) more sensitive to the effects; and
- (c) less able to anticipate, cope with, or recover from the effects.

6.10 Populations at risk potentially include:

- (a) infants and children;
- (b) older adults;
- (c) people with lower socioeconomic status;
- (d) people with a chronic health condition; and
- (e) people with a disability.

6.11 While the vulnerable population mapping was not specially designed for use in district planning hazardous substances risk management, it is useful to understand in the context of PC91. The indices and criteria used are a means of measuring a populations ability to react to adverse effects in general regardless of their source or origin. Thus, highlighting a population who are likely to suffer potentially greater adverse effects of hazardous substance exposure, regardless of its nature.

6.12 As can be seen from the maps in **Attachment 2**, there the most vulnerable populations within central Whangārei are located adjacent to areas of industrial zoning. Not only their population characteristics, but also their location makes them more vulnerable to harm, be it from insidious chronic exposure (as discussed above) or traumatic acute exposure as may occur during an uncontrolled or accidental discharge or fire.

6.13 As such, the effects of individual susceptibility and a group such as sensitive or vulnerable populations response is not necessarily adequately accounted for in approval and associated controls and are therefore a part of residual risk, in my opinion.

6.14 The Hazardous Substance Compliance Report Systems Finding Report 2019 stated:¹¹

“However, there is significant non-compliance, with 75 percent of a sample of New Zealand businesses not fully complying with HSNO’s key risk management controls”

6.15 In my opinion, it follows that the risk from hazardous substances is unlikely to ever be a residual risk since complete compliance is rare. In my now thirty years of compliance and enforcement over multiple areas, I cannot remember ever finding complete compliance in a group of business or activities. A rate of only 25 % compliance is extreme particularly if it is in key risk management controls. Often failure and or non-compliance is generated by operator error for a variety of reasons and is hard to prevent. This reinforces the need for sound rules within the WDP to avoid reverse sensitivity effects and manage conflicts between incompatible activities and further highlights the frailty of reliance on compliance the HSNO controls and the existing zone-based rules alone. Particularly where sensitive activities and vulnerable populations are involved.

Jeffery John Garnham

Date: 2 March 2023

¹¹https://www.epa.govt.nz/assets/Uploads/Documents/EPA-Publications/Hazardous_Substances_Compliance_System_Findings_Report_2019.pdf pg 12

LIST OF ABBREVIATIONS USED IN THIS STATEMENT OF EVIDENCE:

Council	Whangārei District Council
EPA	Environmental Protection Agency
HSNO	Hazardous Substances and New Organisms Act 1996
Ngā Tai Ora	Ngā Tai Ora – Public Health Northland
PC91	Plan Change 91 – Hazardous Substances
RMA	Resource Management Act 1991
S42A	Section 42A of the RMA / Council's s42A Report
U&S Changes	Urban and Services Plan Changes
WDP	Whangārei District Plan

Attachment 1 – CV

1993 – 1997 Employed in by Northland District Health Board Public Health Unit with primary roles being

Environmental Health Officer Far North Council, Regulation of Food Premises, Camping Ground and Hairdressers. Nuisances and Housing issues under Health Act 1956 and Noise under Sections 16 and 326.

Health Protection Officer, Marine Biotoxin Sampling, Food Act Sampling, Resource Management Air Discharge Consent Submissions Jukon New Zealand Mill Discharge Kaitaia and participant in the Community Liaison Group. Work relating to onsite sewage disposal and RMA consent primarily subdivisions. Notifiable disease investigation.

1997 – 2013 Relocated to Kerikeri Bay of Islands, Environmental Health Officer Far North Council, Regulation of Food Premises, approval of Food Safety Plans, Camping Ground and Hairdressers. Nuisances and Housing issues under Health Act 1956 and Noise under Sections 16 and 326. HSNO Enforcement Officer role primarily approval of permissions. RMA consent primarily subdivisions some of which reverse sensitivity issues. Investigation of Spraydrift complaints. Ongoing involvement in Jukon mill as noted above. Also, a member of the Sanitary Works Technical Advisory Committee (Ministry of Health) which involved the approval of various subsidies for the installation and upgrade of sewage works throughout the country. Biosecurity Officer (surveillance for exotic mosquito detection). Border control, Clearing of Ships for Pratique and Sanitary Exemption Certificates. Notifiable disease investigation.

2013 - 2021 Drinking Water Assessor, audit and approval of Water Safety Plans, HSNO Enforcement Officer, Acting team leader Health Protection (June 2013- June 2015). Biosecurity Officer (surveillance for exotic mosquito detection). Border control, Clearing of Ships for Pratique and Sanitary Exemption Certificates. Notifiable disease investigation. COVID Response.

2021- present involved in COVID response, Preparation of evidence for Liquor Licensing Hearing, HSNO Enforcement Officer, Border Control work both COVID and routine as describe above. Notifiable disease investigation.

Attachment 2 – Deprivation Maps



