BAY OF PLENTY REGIONAL COUNCIL

PSGR BRIEF. OCTOBER 26, 2023.

Fluoridation, Human & Environmental Health.

Regulations, monitoring, research and feedback.

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PSGR

Physicians & Scientists for Global Responsibility

TRANSCRIPT

I'm well aware you are sitting here somewhat bemused by my presentation. It is not surprising that fluoride and the environment would 'fall between the cracks' in New Zealand. Around half of the New Zealand population drink fluoridated water, so we might presume there would be policy frameworks, monitoring protocols and assessments of environmental risk from wastewater emissions. But this discussion today concerns the deficit of such measures. It leads to contradictions though – because you are charged with ensuring the life-supporting capacity of water. [1] [2] [3] [4] [5] You are guardians of our fresh and marine water.[6]

This is why we pose 3 questions to Council, because we cannot answer them. They will be published at the end of this talk, to go through if there is time.

I'll now review some relevant policy and law to attempt to shed some light on this situation.

[3] Water Services Act 2021 put in place Taumata Arowai as the drinking-water regulator. The Act's *purpose* is to ensure that drinking water suppliers provide safe drinking water to consumers. A note here. In the Act, section 7 the meaning of safe, - means drinking water that is unlikely to cause a serious risk of death, injury, or illness, - whether or not the serious risk is caused by— 'other causes together with the consumption or use of drinking water.' That's an important point because we are exposed to fluoride in multiple ways.

The Water Services (Drinking Water Standards for New Zealand) Regulations 2022 - is where you go to find fluoride's maximum acceptable value, or MAV, of 1.5 mg/L. The default choice for MAV's come

[1] A Ministry for the Environment video stated that the first priority of Te Mana o te Wai concerned recognising the life-supporting capacity of water. Some Regional Councils have adopted this term in explaining the concept to the public. statehttps://environment.govt.nz/acts-and-regulations/freshwater-implementation-guidance/

[2] Note: The RMA (1991) Section 5(b)had previously directly required officials to safeguard the life-supporting capacity of water.

[3] The replacement RMA, the Natural and Built Environments Act, is less clear, but states, S6, as a system outcome, that: The following aspects of the environment are protected or, if degraded, are restored: (a) the ecological integrity, mana, and mauri of— (i) air, water, and soil; https://www.legislation.govt.nz/act/public/2023/0046/latest/whole.html#whole

[4] Te Aka Dictionary. Mauri 1. (noun) life principle, life force, vital essence, special nature, a material symbol of a life principle, source of emotions - the essential quality and vitality of a being or entity.

[5] The National Policy Statement (2020) introduces *Te Mana o te Wai* as a fundamental concept, recognises that protecting the health of freshwater protects the health and well-being of the wider environment. The hierarchy of obligations in Te Mana o te Wai prioritises: (a) first, the health and well-being of water bodies and freshwater ecosystems; (b) second, the health needs of people (such as drinking water); (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. P.5-6. https://environment.govt.nz/assets/publications/National-Policy-Statement-for-Freshwater-Management-2020.pdf

[6] Natural and Built Environment Act 2023. Purpose of the Act and S 50 Functions of Regional Councils.

from WHO guidelines. The guideline for fluoride, by the way, was set in 1984.[7] Then you see the note below[8]:

> 'For oral health reasons, the Ministry of Health recommends that the fluoride content for drinking-water in New Zealand be in the range of 0.7–1.0 mg/L; this is not a MAV.'[9]

That figure: 0.7-1 mg/L – appears to arise from averages in drinking water levels in North America.[10] New Zealand has never undertaken a toxicological risk assessment to establish where a level of harm might arise. I.e. what is the lowest level where harm might arise in a baby or infant.

[4] The Drinking Water Assurance rules require that fluoride in drinking water is continuously monitored, while fluoride in treated water leaving the treatment plant is required to be sampled twice weekly.

We do know that MAVs are exceeded regularly. The Drinking Water Regulation Report 2022 showed this happened 387 times in 2022. We could talk about Wellington failing to disclose their problems with fluoridation, but we won't.

There is no requirement for this information to be publicly available. It's interesting that Taumata Arowai does not give us the chemical formulation for fluoride.

[5] Here's an example of a water discharge monitoring plan.[11] Waikato Regional Council permitted 19 kilograms a day, at 2 grams per cubic metre (that's at 2 ppm).

From what I understand – there is no data in New Zealand that could inform Waikato that this is a safe procedure for the next 20 years – when the discharge is added to existing chemical contaminants in the discharge, and the fluoride compound (whatever it is) likely includes arsenic, barium, cadmium and uranium.[12] [13] We're seeing in policy documents a failure to state the actual formulation added to DWS.

Without actually talking about this stuff, will water treatment plans ever get funding to filter or degrade toxic chemicals? Will scientific research result in inventions that might scale up globally?

[6] Then we might consider the New Zealand Environmental Protection Authority**.** The Individual Hazardous Substance Approvals August 2022[14] doesn't list any substance conventionally associated with water fluoridation - hydrofluorosilicic acid, fluorosilicic acid, HFA.[15] [16] Searches under the Chemical Classification and Information Database, searches for 'fluoride' 'drinking water', and searches under the HSNO application register or the NZ inventory of chemicals come up empty.

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[7] World Health Organization (2008) Guidelines for Drinking-water Quality. Third edition, Incorporating the first and second Addenda. Volume 1, Recommendations. Geneva. https://www.who.int/publications/i/item/9789241547611

[8] Image on powerpoint [3].

[9] Ministry of Health (2018 Drinking Water standards for New Zealand 2005 (revised 2018). https://archive.org/details/drinking-water-standards-for-new-zealand-2005-revised-2018

[10] Galagan, D.J. & Vermillion, J.R. (1957) Determining optimum fluoride concentrations. Public Health Rep., 72: 491-493.

[11] Decision Addendum. Board of Inquiry. Report and Decision of the Board of Inquiry into the Watercare Waikato River Water Take Proposal. 17, June 2022. https://epa.govt.nz/assets/FileAPI/proposal/NSP000046/Boards-decision/Watercare_decision_addendum_17_June_2022.pdf

[12] Sodium Hexafluorosilicate [CASRN 16893-85-9] and Fluorosilicic Acid [CASRN 16961-83-4] Review of Toxicological Literature. https://ntp.niehs.nih.gov/sites/default/files/ntp/htdocs/chem_background/exsumpdf/fluorosilicates_508.pdf

[13] Mullenix PJ. A new perspective on metals and other contaminants in fluoridation chemicals. Int J Occup Environ Health. 2014 Apr-Jun;20(2):157-66. doi: 10.1179/2049396714Y.0000000062. Epub 2014 Mar 20. PMID: 24999851; PMCID: PMC4090869.

[14] EPA (2022) Individual Hazardous Substance Approvals August 2022. https://epa.govt.nz/assets/Uploads/Documents/Hazardous-Substances/GHS2/Individual-Hazardous-Substance-Approvals.pdf

[15] Water New Zealand (2023) Good Practice Guide, Vol 1. Fluoridation of Drinking Water Supplies in New Zealand. https://www.waternz.org.nz/Attachment?Action=Download&Attachment_id=5632

[16] The three types of common fluoridation agents in New Zealand are fluorosilicic Acid (FSA), Sodium fluoride and Sodium Fluorosilicate.

I'm not aware of any toxicological or epidemiological risk assessment by the NZ EPA to assess the scientific literature on the environmental and health risk of fluoride – this should include analysis on exposure levels for New Zealanders and consider age stratified risk. It hasn't been done. There's no testing by the EPA of fluoride in the environment. The EPA is required to protect the health of people and the environment, and it is also required to take a precautionary stance. Has the EPA blindly ignored the implications of aggregate exposures in the environment with the scaling up of fluoridation?

Has ESR undertaken environmental assessments of fluoride? No. And ESR does not monitor fluoride in the groundwater study.

Of course, resource consents go through regional councils, who theoretically depend on the EPA for authority in the permitting of emissions. Would civil society presume an environmental analysis would be done for New Zealand and that emissions were being monitored? I think they would?

[7] Natural and Built Environment Act (NBEA) is the main replacement for the Resource Management Act 1991. The NBEA introduces the National Planning Framework (NPF) which includes environmental limits and targets. As you know, limits will be set across 6 aspects of the natural environment – air, indigenous biodiversity, coastal water, estuaries, freshwater and soil.

16 natural and built environment plans (NBEA plans) will replace the regional policy statements and district and regional plans currently required under the RMA.

This Act provides for the establishment of a freshwater working group which focusses on allocation. Only allocation, not for example, pollution. Until a region has an NBEA plan in place, much of the RMA continues to apply.

The National Policy Statement for Freshwater 2020 sits alongside the NBEA. It was updated in 2023. The Resource Management (National Environmental Standards for Freshwater) Regulations 2020, made under section 43 of the RMA 1991 came into force in August 2020. The sediment requirements[17] do not include any note of pollutant chemicals, which of course bind to sediment and persist in dark environments.

[8] Chemical pollutants are broadly left out of policy and law in New Zealand. Lets look at the just released Our freshwater 2023. It's demonstrably evident that industrial, agrichemical and wastewater pollution into our freshwater is downplayed. Nutrients, pathogens and sediments are commonly cited – we're getting better at talking about heavy or trace metals. But broader chemical pollution is left out.

[9] National Environmental Standards for Freshwater (NES) are published in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (LI 2020/174). So you can see here in the Policy statement – which contains the NES – the standards for attributes requiring limits and action plans. Nutrients like nitrogen, water quality indicators like dissolved oxygen and pathogens like E. coli.

Theres no language in the policy should parameters decline to step into a suite of screens to identify drivers - potential pollutant chemicals from industrial, agrichemical or wastewater sources.

[10] Ultimately, as regional councillors, you are required to ensure the life-supporting capacity of water.

But if we look at the text of the NBEA legislation, no consideration is made of diffuse emissions and contaminant mixtures. Emissions in the NBEA solely concern odours, greenhouse gas, and noise. National Environment Standards don't cover this, nor the EPA. ESR aren't doing the work either.

[17] Ministry for the Environment. 2022. Guidance for implementing the NPS-FM sediment requirements. Wellington: Ministry for the Environment.

Diffuse mixtures, and aggregation from pollutant chemicals or even modified organisms, are outside the scope – unless a lawyer can correct me on this subject. We're not monitoring, and it is presumed that mixtures of every emission at the level presumed safe, will never threaten the life-supporting capacity of water.

[11] In 2019 PSGR and the Soil and Health Association, released a paper[18] that revealed that chemical pollution has been kept outside policy for over a decade. We said:

> *'the 'big three' pollutants ...have bottom lines – E. coli, nitrogen, phosphorous. Every other attribute (in the National Policy Statement Appendix 2A) is an indicator of ecosystem health that reflects pollution or degrading activities. There is no national policy process requiring that regions step into a suite of monitoring screens once indicators show harm is occurring.*

Some twenty organisations signed onto this paper, it was soundly ignored.

The current status of policy and legislation creates an *absence* of policy support and resourcing for officials who might consider that the prospective increased release of fluoride into the environment from wastewater treatment plants across New Zealand is not in the best interest of the environment. Current emissions from fluoridated cities appear out of scope also. There is no legislation nor policy requiring that the chemical signatures in river basins and catchments are formally monitored and made public for civil society, policy makers and scientists.

[12] When BOP citizens look online, they are told that for BOPRC 'protecting our environment from pollution is of the utmost importance.' Your pollution hotline concerns single source point events, not diffuse emissions. It's silent on pollution accumulation. Of 1700 monitoring sites around the region, which are regularly tested as part of the Natural Environment Regional Monitoring Network (NERMN) – I'm dubious that a single one of these would screen for, for example, commonly sprayed pesticides or fluoride compound levels. The Environmental Data Portal (EDP) is silent on chemical pollutants. Estuary water quality[19], estuary health[20], river water quality[21] concern a very limited group of attributes.

The national standards permit this. Perhaps this is why on the Environmental Data Portal – we can't search for testing results for chemical screens. Are regionally typical herbicides aggregating, do drugs and fluoride released from waste streams pollute our rivers? It's of scope.

It's very Māori friendly, but I suspect that my Māori colleagues want to know that you are testing for pollutant chemicals, not tip-toing around them, or greenwashing the issue.

You can see how the legislation and policy trickles down to your immediate business – and it is not your business to consider fluoride. It's out of scope.

[13] Fluorinated compounds are a rapidly increasing group of compounds that should not be ignored. There has been a rapid increase in emissions of fluorochemicals, through fluorine containing pharmaceuticals and agrichemicals. Currently, fluorine-containing compounds constitute around 25% of small-molecule drugs in the clinic, and 25−30% of newly introduced drugs contain fluorine atom(s).

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[18] Soil and Health Association and Physicians and Scientists for Global Responsibility New Zealand Charitable Trust. 2019 Aotearoa New Zealand Policy Proposals on healthy waterways: Are they fit for Purpose? (2019). ISBN 978-0-473-50130-3

[19] Water temp, electrical conductivity, pH, dissolved oxygen, water clarity, chlorophyll.

[20] Sediment accumulation rate, sediment grain size anoxic depth, heavy metals ((mg/kg dry weight) (Arsenic, cadmium, chromium, copper, lead, nickel, mercury, zinc), Polycyclic aromatic hydrocarbons

[21] Water temp, electrical conductivity, pH, dissolved oxygen, water clarity, phosphorous, water colour.

We've seen the rapid expansion of fluoropolymers, or polyfluoroalkyl substances (PFAS such as Teflon), and perfluorinated compounds. Phosphate fertilisers are another source of fluoride.[22]

[14] Fluoride is an endocrine disruptor with the potential to disrupt the function of tissues that require iodine. This is of special concern in children. Fluoride crosses the placenta[23] and brain barrier[24], and the toxicity of even low concentrations of F^- is enhanced in the presence of aluminium.[25]

If we consider risk to the thyroid – this is of relevance for you if you are stewarding freshwater. I quote

> *'all vertebrates, from fish and frogs to humans, produce and use thyroid hormone, and that thyroid hormone in all these different species has exactly the same chemical structure.'*

This is why tadpoles can be used to measure the effects of chemicals on thyroid hormone action. The amphibian model is relevant to humans, and importantly, relevant to brain development.[26]

As Jaques Legrand said:

> *'Without a minimum of thyroid hormone at the right time, a tadpole fails to become a frog and a human baby becomes a cretin'.* [27]

Our developing babies require the right amount of thyroid hormone, at the right time. Of course, iodine deficiency, which hampers thyroid function, is the world's main source of mental retardation. [28] [29]

Fluoride seems to influence the transport of iodine, another halogen, into the thyroid, leading to thyroid dysfunction.

Tell me about frogs, fish and tuna? How are they impacted by constant dispersal of fluoride in water?

[15] Fluoride can accumulate in the body, 'About 50% of the daily intake of fluoride is, within 24 h, deposited mainly in calcified tissues - such as bones and teeth, as well as calcium-containing glands such as the pineal gland. These tissues contain approximately 99% of the body's fluoride, and the remainder is distributed between the blood and soft tissues, where rapidly a steady-state distribution between extracellular and intracellular fluids is established.'[30]

Babies and children will retain more: 'This 50:50 distribution is strongly shifted to greater retention in the very early and probably toward greater excretion in the later years of life. Young children can retain up to 80% of fluoride due to increased uptake by the developing skeleton and teeth.' [31]

[16] New Zealand has never undertaken a comprehensive review of the literature of these issues.

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[22] Han J, Kiss L, Mei H, Remete AM, Ponikvar-Svet M, Sedgwick DM, Roman R, Fustero S, Moriwaki H, Soloshonok VA. Chemical Aspects of Human and Environmental Overload with Fluorine. Chem Rev. 2021 Apr 28;121(8):4678-4742. doi: 10.1021/acs.chemrev.0c01263. Epub 2021 Mar 16. PMID: 33723999; PMCID: PMC8945431.
[23] Shen YW, Taves DR. Fluoride concentrations in the human placenta and maternal and cord blood. Am J Obstet Gynecol. 1974;119(2):205–7.
[24] Lubkowska A, Chlubek D, Machoy-Mokrzynska A, Nowacki P. Distribution of fluoride in selected structures of the central nervous system in rats exposed to NaF and AlCl3 in drinking water. Trace Elem and Electroly. 2012;29(3):162–71.
[25] Han et al (2021).
[26] Demeneix B., Toxic Cocktail. Oxford University Press, 2017. p.30.
[27] Demeneix B., Toxic Cocktail. Oxford University Press, 2017. p.30.
[28] Demeneix B., Toxic Cocktail. Oxford University Press, 2017. p.30.
[29] https://www.who.int/data/nutrition/nlis/info/iodine-deficiency
[30] Han et al (2021).
[31] Han et al (2021).

The Ministry of Health are relying on two papers by the Office of the Prime Ministers Chief Science Advisor (PMCSA)[32] [33], to justify fluoridating New Zealand. But not any thorough meta-analyses.

No experts in endocrinology and neurodevelopmental risk were involved. The 2021 paper alluded to US and European references where no recommended safe levels were set for babies.[34] [35]

[17] Fluoride crosses the placenta and the blood brain barrier. A large range of studies provide weight that fluoride exposures lower IQ. Thyroid hormones not only influence intelligence, but have multiple effects on metabolism and are associated with different systems and organs, e.g. cardiovascular, central nervous and digestion system, bone growth, and breathing. Information on the relationship between fluoride exposure and ADHD is consolidating. [36]

A September 2022 US National Toxicology Program draft document has been released.[37] While it has been downplayed locally, this paper provides an important glimpse into this debate. What might be drawn from this, is the extent to which findings are inconsistent. What is occurring is an increasing weight of evidence that suggests neurodevelopmental harm. These studies, this body of evidence can't be easily dismissed, when, if we are incorrect – we might end up with a lower proportion of dental caries, but a population shift to the left, of lowered IQ.[38] Or increased cases of ADHD.[39] [40]

[18] We are all dealing with, PSGR theorises, deficient policies and the processes. It's more difficult for us to get a grasp on the associated health burden when central government is not an impartial arbiter, but firmly states fluoridation of drinking water is safe and release into the environment is safe. There's no science in the environment – no science on health risk – no requirement nor funding do that science locally. Nearly half of the population is fluoridated but our brain research institutes aren't researching this relationship. Or at least no funding is going through the Health Research Council.

The margin between the beneficial and deleterious effects of fluoride appears to be narrow and the data on deleterious effects is increasing rapidly.

Councillors, perhaps the easiest way to explain this, is to state that you are failed by the policy environment, which is, of course, tied directly to funding avenues. These policies limit your scope for taking action to fulfil your obligations of policy and law, to protect the life-supporting capacity of water.

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[32] Gluckman PD and Skegg D. Health effects of water fluoridation: A review of the scientific evidence. Office of the Prime Minister's Chief Science Advisor and the Royal Society of New Zealand, August 2014. https://www.royalsociety.org.nz/assets/documents/Health-effects-of-water-fluoridation-Aug-2014-corrected-Jan-2015.pdf
[33] Fluoridation: an evidence update, Office of the Prime Minister's Chief Science Advisor (June 2021). https://bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/01/OPMCSA-Fluoridation-Webpage-Content-11102021.pdf
[34] Misleading comment, the adequate daily intake for fluoride from birth to 6 months was 0.01 mg daily intake. https://ods.od.nih.gov/factsheets/Fluoride-HealthProfessional/
[35] Europe: The recommendation for the first year of life was 0 mg daily. European Food Safety Authority (2019). Dietary reference values for nutrients. Summary report. EFSA supporting publication 2017:e15121: 98. Page 2. https://www.efsa.europa.eu/sites/default/files/assets/UL_Summary_tables.pdf
[36] Han et al (2021).
[37] DRAFT NTP Monograph on the State of the Science Concerning Fluoride Exposure and Neurodevelopmental and Cognitive Health Effects: A Systematic Review. US National Toxicology Program, September 2022. https://ntp.niehs.nih.gov/sites/default/files/ntp/about_ntp/bsc/2023/fluoride/documents_provided_bsc_wg_031523.pdf
[38] Discussed here: 2023 study on fluoride & IQ contradicts so-called 'safe' levels in drinking water. Grandjean et al. October 2023. https://www.youtube.com/watch?v=8xVFwu_NWLQ&t
[39] Bashash et al (2023). Prenatal fluoride exposure and attention deficit hyperactivity disorder (ADHD) symptoms in children at 6–12years of age in Mexico City. Environment International. 121 (2018) 658–666, DOI: 10.1016/j.envint.2018.09.017
[40] Griebel-Thompson AK et al. (2023) A Scoping Review of Iodine and Fluoride in Pregnancy in Relation to Maternal Thyroid Function and Offspring Neurodevelopment, Advances in Nutrition 14 (2023) 317–338. DOI: 10.1016/j.advnut.2023.01.003

Questions for the Bay of Plenty Regional Council.

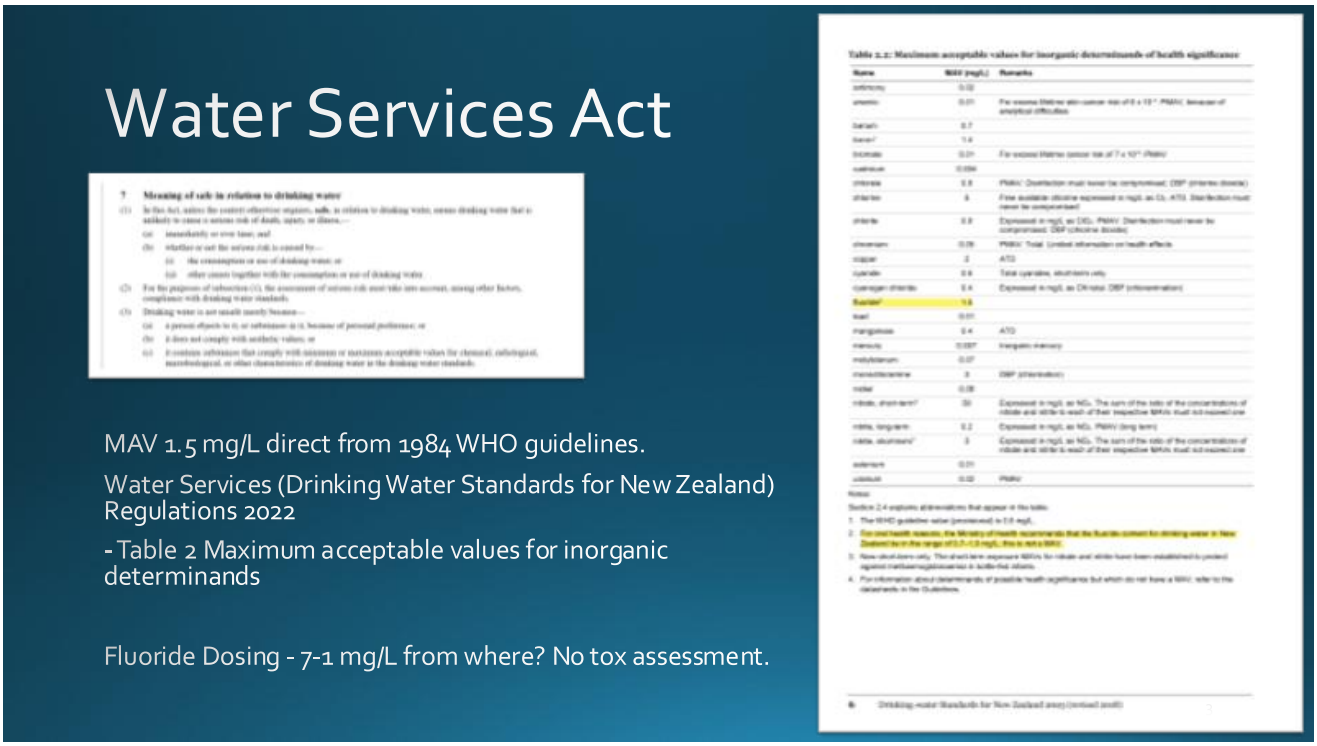
1. Where does regional council store information on the background level of fluoride in freshwater (including groundwater) and sediment across the Bay of Plenty so that the scientific community and civil society may assess whether this level changes?

2. How do the public access all regional resource consents for fluoride emissions into water, and related information which includes the formulant mixture, including disclosure of co-ingredients such as trace metals?

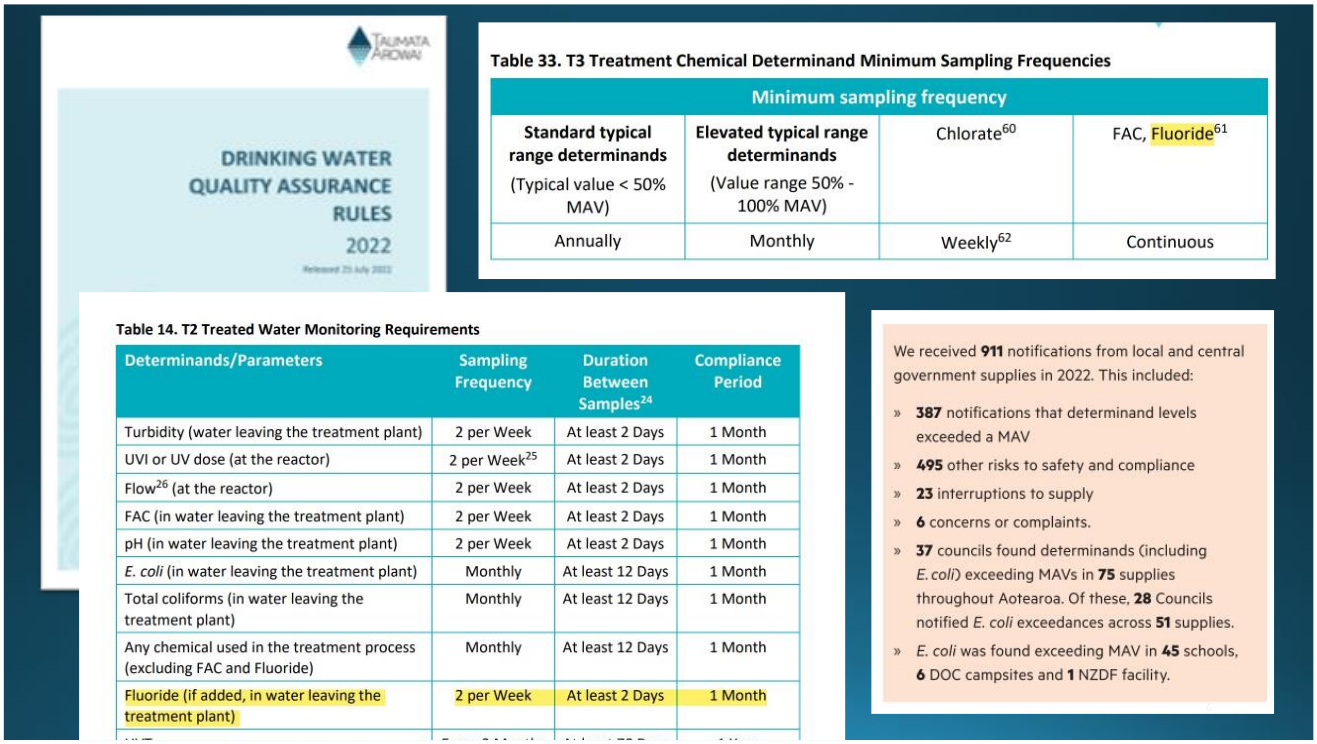
3. Where are regulations (processes) if a body of water (freshwater management unit?) falls below a national bottom line; or is not achieving or is not likely to achieve a target attribute, - that would include a requirement for Regional Councils to screen this body of water for a range of environmental contaminants including pesticides, trace metals, pharmaceuticals, fluoride compounds and other potential contaminants?

POWERPOINT SLIDES.

[3]



[4]



DRINKING WATER QUALITY ASSURANCE RULES 2022

Table 33. T3 Treatment Chemical Determinand Minimum Sampling Frequencies

Minimum sampling frequency			
Standard typical range determinands (Typical value < 50% MAV)	**Elevated typical range determinands** (Value range 50% - 100% MAV)	Chlorate[60]	FAC, Fluoride[61]
Annually	Monthly	Weekly[62]	Continuous

Table 14. T2 Treated Water Monitoring Requirements

Determinands/Parameters	Sampling Frequency	Duration Between Samples[24]	Compliance Period
Turbidity (water leaving the treatment plant)	2 per Week	At least 2 Days	1 Month
UVI or UV dose (at the reactor)	2 per Week[25]	At least 2 Days	1 Month
Flow[26] (at the reactor)	2 per Week	At least 2 Days	1 Month
FAC (in water leaving the treatment plant)	2 per Week	At least 2 Days	1 Month
pH (in water leaving the treatment plant)	2 per Week	At least 2 Days	1 Month
E. coli (in water leaving the treatment plant)	Monthly	At least 12 Days	1 Month
Total coliforms (in water leaving the treatment plant)	Monthly	At least 12 Days	1 Month
Any chemical used in the treatment process (excluding FAC and Fluoride)	Monthly	At least 12 Days	1 Month
Fluoride (if added, in water leaving the treatment plant)	2 per Week	At least 2 Days	1 Month

We received **911** notifications from local and central government supplies in 2022. This included:

- **387** notifications that determinand levels exceeded a MAV
- **495** other risks to safety and compliance
- **23** interruptions to supply
- **6** concerns or complaints.
- **37** councils found determinands (including *E. coli*) exceeding MAVs in **75** supplies throughout Aotearoa. Of these, **28** Councils notified *E. coli* exceedances across **51** supplies.
- *E. coli* was found exceeding MAV in **45** schools, **6** DOC campsites and **1** NZDF facility.

[5]

Waikato Discharge Monitoring Plan (DMP)

As a minimum, the DMP must include procedures for monitoring the following:

(3) Water quality determinands in any discharge back to the Waikato River. As a minimum these must include: v. *fluoride*

DECISION ADDENDUM Report and Decision of the Board of Inquiry into the Watercare Waikato River. Water Take Proposal. 17 June 2022

- Fluorosilicic acid: arsenic, barium, cadmium, uranium

Parameter	Units	Median	92nd Percentile	Maximum
Total Suspended Solids	kg/day	500	800	1,000
	g/m³	–	–	50
Dissolved Aluminium	kg/day	40	70	80
	g/m³	–	–	4
Fluoride	kg/day	9.5	17	19
	g/m³	–	–	2
Free Available Chlorine	g/m³	0.13	0.2	0.25
Chemical Oxygen Demand (as a proxy for glycerine)	g/m³	–	–	10
pH	between 6.5 and 9 pH units (no median, percentile or maximum values apply)			

5

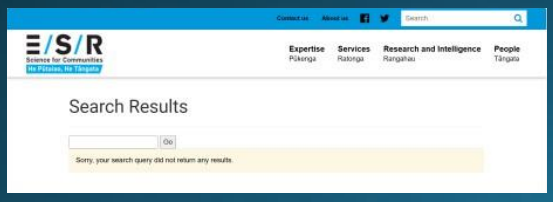
[6]

NZ EPA?

What is the product that the EPA would review?

No environmental risk analysis

ESR: Fluoride not in groundwater survey



Safety Data Sheet

ORICA CHEMICALS

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**HYDROFLUOROSILICIC ACID**
Other name(s):	Hydrofluosilicic acid; Hydrosilicofluoric acid; HFA.
Recommended Use:	Water fluoridation; sterilising equipment.
Supplier:	Orica New Zealand Limited
Street Address:	Orica Chemnet House Level four, 123 Carlton Gore Road Newmarket, Auckland New Zealand
Telephone Number:	+64 9 368 2700
Facsimile:	+64 9 368 2710
Emergency Telephone:	0 800 734 607 (ALL HOURS)

2. HAZARDS IDENTIFICATION

Classified as a Dangerous Good according to NZS 5433:2007 Transport of Dangerous Goods on Land.

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

Subclasses:
Subclass 6.1 Category D - Substances which are acutely toxic.
Subclass 8.1 Category A - Substances that are corrosive to metals.
Subclass 8.2 Category C - Substances that are corrosive to dermal tissue.
Subclass 8.3 Category A - Substances that are corrosive to ocular tissue.

Approval Number: HSR004496

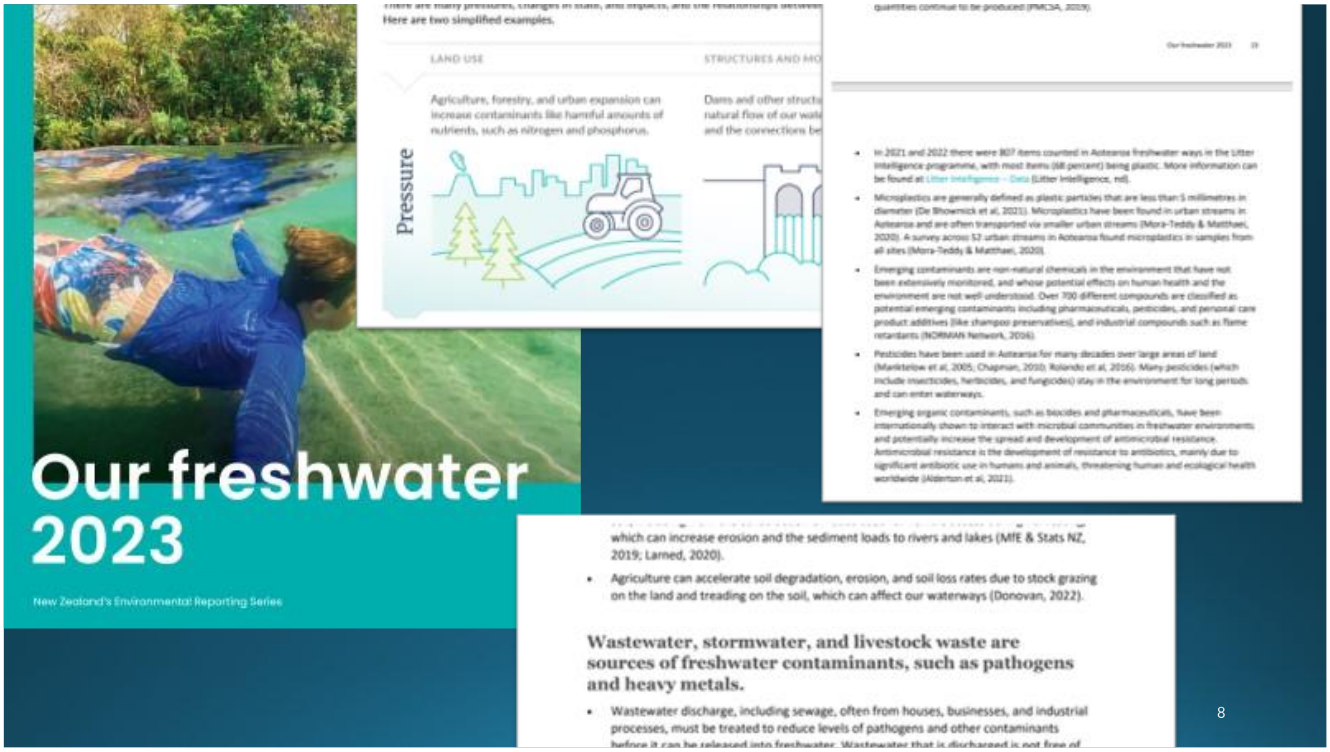
Hazard and Precautionary Information:
Danger.

6

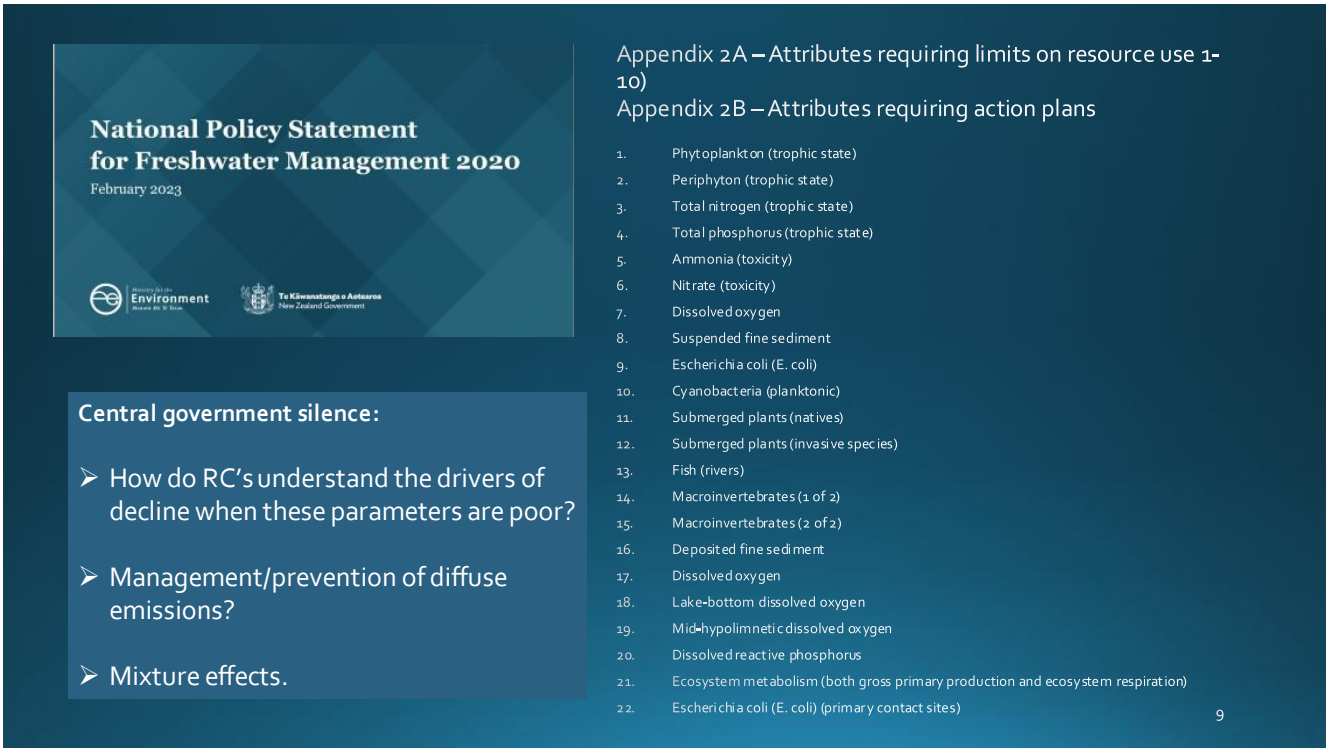
[7]

7

[8]


Here are two simplified examples.
LAND USE
Agriculture, forestry, and urban expansion can increase contaminants like harmful amounts of nutrients, such as nitrogen and phosphorus.
Pressure
Our freshwater 2023
New Zealand's Environmental Reporting Series
which can increase erosion and the sediment loads to rivers and lakes (MfE & Stats NZ, 2019; Larned, 2020).
Agriculture can accelerate soil degradation, erosion, and soil loss rates due to stock grazing on the land and treading on the soil, which can affect our waterways (Donovan, 2022).
Wastewater, stormwater, and livestock waste are sources of freshwater contaminants, such as pathogens and heavy metals.
Wastewater discharge, including sewage, often from houses, businesses, and industrial processes, must be treated to reduce levels of pathogens and other contaminants
8

[9]


National Policy Statement for Freshwater Management 2020
February 2023
Environment
Te Kāwanatanga o Aotearoa
New Zealand Government
Central government silence:
How do RC's understand the drivers of decline when these parameters are poor?
Management/prevention of diffuse emissions?
Mixture effects.
Appendix 2A – Attributes requiring limits on resource use 1-10)
Appendix 2B – Attributes requiring action plans
1. Phytoplankton (trophic state)
2. Periphyton (trophic state)
3. Total nitrogen (trophic state)
4. Total phosphorus (trophic state)
5. Ammonia (toxicity)
6. Nitrate (toxicity)
7. Dissolved oxygen
8. Suspended fine sediment
9. Escherichia coli (E. coli)
10. Cyanobacteria (planktonic)
11. Submerged plants (natives)
12. Submerged plants (invasive species)
13. Fish (rivers)
14. Macroinvertebrates (1 of 2)
15. Macroinvertebrates (2 of 2)
16. Deposited fine sediment
17. Dissolved oxygen
18. Lake-bottom dissolved oxygen
19. Mid-hypolimnetic dissolved oxygen
20. Dissolved reactive phosphorus
21. Ecosystem metabolism (both gross primary production and ecosystem respiration)
22. Escherichia coli (E. coli) (primary contact sites)
9

[10]

Regional Council Obligation -

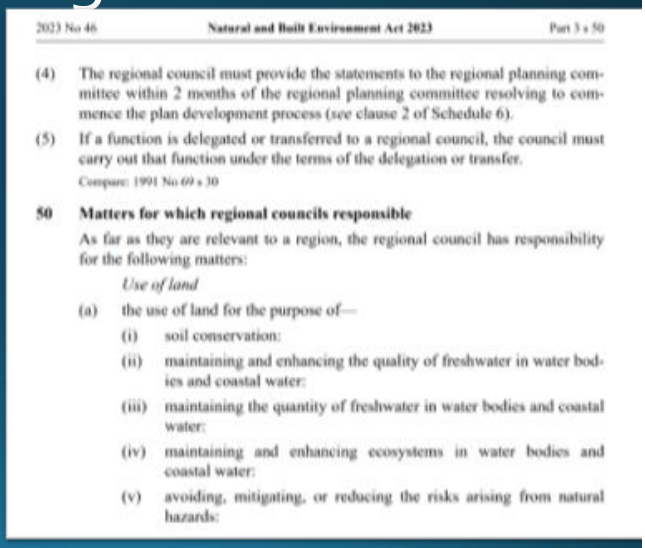
RCs: implement the NPS-FM 2020

RCs: charged with giving effect to Te Mana o te Wai - ensuring the life-supporting capacity of freshwater.

Diffuse emissions and pollutant mixtures ignored by:

- Natural & Built Environments Act;
- National Policy statement/NES
- NZ EPA

No central government policy or scientific and technical support to understand pollutant drivers.



2023 No 46 **Natural and Built Environment Act 2023** Part 3 s 50

(4) The regional council must provide the statements to the regional planning committee within 2 months of the regional planning committee resolving to commence the plan development process (*see* clause 2 of Schedule 6).

(5) If a function is delegated or transferred to a regional council, the council must carry out that function under the terms of the delegation or transfer.

Compare: 1991 No 69 s 30

50 Matters for which regional councils responsible

As far as they are relevant to a region, the regional council has responsibility for the following matters:

Use of land

(a) the use of land for the purpose of—

(i) soil conservation:

(ii) maintaining and enhancing the quality of freshwater in water bodies and coastal water:

(iii) maintaining the quantity of freshwater in water bodies and coastal water:

(iv) maintaining and enhancing ecosystems in water bodies and coastal water:

(v) avoiding, mitigating, or reducing the risks arising from natural hazards:

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[11]

Questions for Council

1. Where does regional council store information on the background level of fluoride in freshwater (including groundwater) and sediment across the Bay of Plenty so that the scientific community and civil society may assess whether this level changes?
2. How do the public access all regional resource consents for fluoride emissions into water, and related information which includes the formulant mixture, including disclosure of co-ingredients such as trace metals?
3. Where are regulations (processes) if a body of water (freshwater management unit?) falls below a national bottom line; or is not achieving or is not likely to achieve a target attribute, - that would include a requirement for Regional Councils to screen this body of water for a range of environmental contaminants including pesticides, trace metals, pharmaceuticals, fluoride compounds and other potential contaminants?

2