Department of Conservation
*Te Papa Atawhai*

20-E-0005 / DOC 6193694

28 January 2020

T Benseman
*Via FYI.org.nz*

Dear Mr Benseman

We refer to the Official Information Act request you submitted to the Department of Conservation on 23 December 2019 via the *FYI* website.

Before responding to your request, we set out the following contextual information that is relevant to the issues you have raised.

**1080 is biodegradable**

1080 bait is biodegradable and does not accumulate in the food chain. 1080 in uneaten bait pellets and animal carcasses are broken down by certain species of bacteria and fungi which have the ability to degrade sodium fluoroacetate by the process of 'defluorination'.

*Defluorination*

Defluorination is a chemical reaction which releases the fluoride from fluoroacetate to form non-toxic products like glycolate. Defluorination is the primary mechanism through which sodium fluoroacetate is detoxified/degraded in the environment following 1080 bait application.

A range of microorganisms have been isolated from the New Zealand soil environment and shown to biodegrade 1080, including bacteria (*Pseudomonas sp., Bacillus subtilis, Lactobacillus spp., Staphylococcus aureus*) and fungi (*Penicillium, Aspergillus, Fusarium* and *Mucor* species).[1] Under favourable conditions, 1080 in baits may be defluorinated within 1-2 weeks.[2]

After biodegradation has taken place, all that remains in the soil are natural compounds and minerals such as glycolate, fluoride and carbon that are normally found in the environment. These metabolites are non-toxic, and are unlikely to cause harm to plants or animals.

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[1] CL Bong (1979) "Biodegradation of sodium monofluoroacetate (compound 1080)", *PhD Thesis, University of Canterbury, New Zealand* and JRL Walker (1993) "Degradation of sodium monofluoroacetate by soil micro-organisms", *Proceedings of the Science Workshop on 1080, Christchurch, New Zealand* pp 50-53.

[2] C Eason et al (2011) "An updated review of the toxicology and ecotoxicology of sodium fluoroacetate (1080) in relation to its use as a pest control tool in New Zealand", *New Zealand Journal of Ecology* 35(1): 1-20.

Conservation House - *Whare Kaupapa Atawhai*
PO Box 10 420, Wellington 6143
Telephone (04) 471 0726, Fax (04) 381 3057

*Effect on bacteria*

Field and laboratory studies have found that healthy populations of some bacteria species continue to increase when 1080 is present. Researchers have examined the effects of 1080 in soil and concluded that any 1080 residue that reaches the soil will therefore be destroyed within a few weeks.[3]

## 1080 in streams, rivers and lakes

Over 60 years of evidence has shown that 1080 does not accumulate in water, soil or animals. 1080 is highly soluble and will quickly dissolve and leach out of uneaten bait pellets that land in water bodies. Microorganisms and plants in the water will then break down the 1080 into harmless, non-toxic compounds as explained above.

Extensive scientific research has also determined that there is no evidence of significant or prolonged 1080 contamination in surface waters. Between 1990 and 2018, 1,380 water samples (taken from New Zealand drinking water supplies, including streams with water intake points) were tested for 1080. Only five of those samples disclosed harmless traces of 1080 all of which were well below the Ministry of Health's contamination standards for drinking water. The remaining 1,375 samples showed no detectable trace of 1080.

A helpful summary of various scientific studies on the effects of 1080 on water can be found in the following published article:

https://newzealandecology.org/nzje/2968.pdf.

## 1080 degrades in animal carcasses

1080 breaks down in carcasses of poisoned animals. This breakdown may be facilitated by microorganisms, degradation of fluoroacetate in the carcass, leaching of 1080 from the carcass into the soil and/or tissue autolysis.[4]

Scientists have studied the degradation of 1080 in carcasses of animals that have succumbed to 1080 poisoning. Around 40 – 75 days after a 1080 operation in the Wairarapa region, scientists observed that carcasses of poisoned possums were decomposing. They also observed that the levels of 1080 in the carcass stomachs had reduced from 30.6mg/kg (25 days after the application of 1080) to 4.9mg/kg (75 days after the application of 1080).[5]

Scientists have also observed that levels of 1080 residue found in the muscles of a sheep carcass declined exponentially 4 hours after exposure to 1080.[6] In a separate study, scientists also observed that the presence of blowfly maggots increased the rate of loss of 1080.[7]

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[3] WAL David and BOC Gardiner (1996) "Persistence of Fluoroacetate and Fluoroacetamide in Soil", *Nature* Vol 209 Issue 5030.
[4] C Eason et al (2013) "Secondary poisoning risks from 1080-poisoned carcasses and risk of trophic transfer - a review", *New Zealand Journal of Zoology* Vol 40 Issue 3.
[5] See 3, above.
[6] CG Rammell (1993) "Persistence of compound 1080 in sheep muscle and liver", *Surveillance* Vol 20 Issue 1.
[7] See https://www.epa.govt.nz/assets/FileAPI/hsno-ar/HRE05002/9917ed4348/HRE05002-054.pdf.

The consensus of scientific evidence therefore does not suggest that the use of 1080 could contribute to water pollution in the way you describe.

**Your OIA request**

We now consider your OIA request. For ease of reference, we have considered each part of your request separately below.

*Biodegradability of 1080*

We consider that the information we have set out above answers the questions you have raised regarding this issue and forms our response to this part of your request.

*Concerns regarding water pollution*

As explained above, the Department does not believe that the use of 1080 contributes to water pollution and does not hold any information which suggests otherwise. We are therefore refusing this part of your request under section 18(e) of the Official Information Act 1982.

*Social licence to use 1080*

We have taken this part of your request to mean that you are seeking information regarding a social licence to continue to use 1080 for pest control operations in New Zealand.

The Department of Conservation commissions the *Survey of New Zealanders* every few years. The results of the 2019 survey show that a majority of New Zealanders support, or conditionally accept, the use of 1080 as a tool for predator control.

The results of the 2019 survey are published on the Department's website and can be accessed via the following link: https://www.doc.govt.nz/survey-of-nzers-2019.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how you can make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Yours sincerely

Ann Thompson
Acting Director Threats - Biodiversity
for Director-General