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Auckland Council

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Dear Jenny

Re: Foamstream assessment

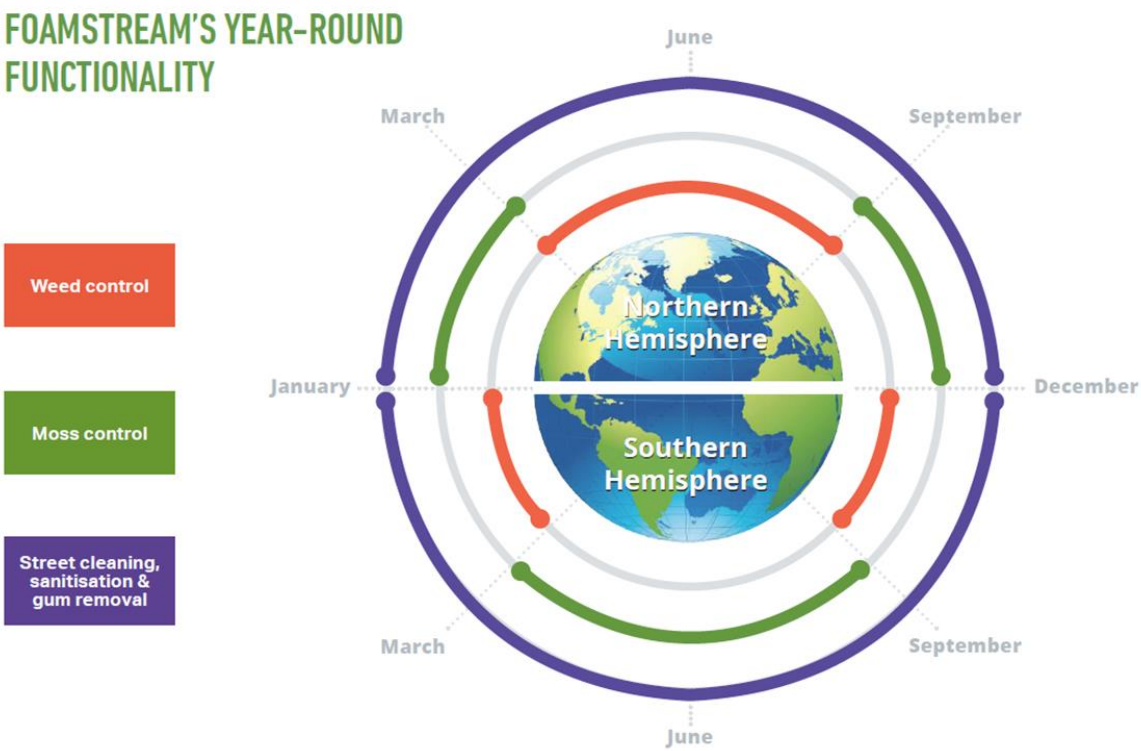
Below is my response to your request for an assessment of the use of Foamstream for weed management in road corridors. I have addressed each of the elements of your project brief separately.

1. Desktop research on usage of the product in New Zealand and overseas to determine the likely conditions for and environment of application.

Foamstream is a soluble concentrate containing sugars of decyloctylglycosides and C6 to C10 chain length even-numbered alkyl glycosides as the surfactant foaming agents, plus other components (coconut, palm kernel and rapeseed oils, glucose from potato, maize and wheat, and polysaccharides). Foamstream has herbicidal properties through a non-toxic mode of action; the herbicidal effect comes from the prolonged heat of the foam. The foam acts to keep the formulation on the plants longer, as well as being an insulator to keep the heat higher for longer.

Foamstream is intended as a herbicide for control of weeds, moss and algae in publicly accessible areas, such as cobbles, pavements, monuments, street furniture, parks, and schools.

The diagram below shows how Foamstream can be used all year round for a variety of purposes, e.g. weed control in the warmer seasons and moss control in cooler seasons. Source: https://www.weedingtech.com/blog/glyphosate-vs-foamstream-which-form-of-weed-control-is-right-for-your-organisation/



The product is registered for use in public spaces around the world and is used in cities in North America (USA and Canada), Europe, the United Kingdom, Australia and New Zealand. It is certified as biodegradable by the EU and is approved for use on organic farming in the UK. It has been cleared for use as an organic, non-toxic, safe product by the following organisations: US EPA (Federal), Health Canada (Canada), CDPR (California), Kemi (Sweden), Department of Agriculture (Washington State), Department of Environmental Protection (New York), REACH (UK).

A number of case studies illustrate its application (https://www.weedingtech.com/nz/case-studies/). I have summarised these case studies below:

Case study #1: South West Water (water supplier), Devon, United Kingdom.

Used to treat percolating filter beds, hard surfaces and walkways. The filter beds are used as part of the biological sewage treatment system and were overgrown with moss and fungi, reducing their efficacy.

Case study #2: Burley's Landscaping Contractors, United Kingdom.

Used to treat weeds on hard and soft surfaces including parks, playgrounds, schools, residential areas, sports pitches and tennis courts. Also used to remove graffiti on walls and other stone surfaces.

Case study #3: City of Courtenay, Canada.

Used on asphalt, concrete and cobbles in a city with many beaches, rivers and lakes and natural outdoor recreational spaces. Regulates non-essential use of pesticides on both public and private land to help minimise any potential risk posed to human and environmental health and well-being.

Case Study #4: Glastonbury Council, Somerset, United Kingdom.

Used in the town centre, on cobbles and stone streets, residential areas, playgrounds, parks, and around school edges. The city voted to ban herbicide use because of community pressure and identified Foamstream as the only viable option in terms of financial viability and effectiveness. Foamstream's ability to be used in adverse weather conditions without inhibiting effectiveness was a strong consideration point. Its effectiveness increases over time due to decreased regrowth of weeds.

Case study #5: E-Tradgard (gardening company servicing municipalities, public companies and private individuals), Sweden

Used on hard surfaces including cobbles, gravel, tiles, block paving, concrete walls and on soft surfaces including hedge lines in public spaces. Wanted a product that was 100% safe for use around people, animals and the environment.

Case study #6: Yeo Valley Farm, Somerset, United Kingdom

Used on gravel car park, paving, around buildings and garden beds. As an organic farm needed a product that suited this status and offered a less labour-intensive option.

New Zealand applications include treatment of algae on a boat slipway (unrestricted use allows flexibility around waterways), treatment of rubber matting overrun by Kikuyu grass, sporting grounds, garden edging, roadside weeds.

2. Evaluation of the rationale behind controls included in the EPA approval

2.1 Rationale for controls

The rationale for the controls is based on the hazard classification of the Foamstream V4 and includes consideration of the potential hazards associated with the individual components and the combined components (using mixture rules whereby the hazards of all individual components are considered together). In their assessment, the EPA determined that the hazard classifications for Foamstream V4 were based on skin irritancy and eye corrosivity (which was consistent with the applicant's classification). In addition, the EPA determined that Foamstream V4 triggered the hazard classification for biocidal activity on the basis that it has properties that "are slightly harmful to the aquatic environment or are otherwise designed for biocidal action."

2.1 Biocidal properties are quickly lost from cooling of the product

Foamstream V4's biocidal properties result from the application of hot water, with the foaming agents assisting in the retention of the heat on the surface for longer than would occur if hot water alone was used. Therefore, loss of heat logically results in a reduction in the biocidal effect.

2.2 Comment on recommendations that adverse effects to the environment beyond the application area can be avoided by the prescribed controls.

The prescribed controls refer to those controls defined in the Appendix of the EPA Decision document (dated 20 August 2018).[1] These include standard EPA controls for labelling, handling, disposal, storage and use (defined by legislation), and an additional control specific to this application requiring that the substance only be applied with a Foamstream Municipal machine, and a range of requirements under the Health and Safety at Work (HSW) legislation which are required for all substances with the same classification as Foamstream. The additional control the EPA put in place was to mitigate the risk of adverse effects that Foamstream V4 could present to organisms in the environment (Decision Document para 5.1).

There is no evidence in the EPA decision documentor in the Staff Advice report[2] to indicate that the EPA staff considered that the foaming agents possessed ecotoxic properties. No Environmental Exposure Limit (EEL) was set by the EPA, who considered that, with proposed controls in place, adverse effects to the environment were assessed as being negligible. I also note that the risk assessment undertaken by the EPA staff "has taken into account the full life cycle of the substance, including import, packaging, transport, storage, use and disposal" (EPA Decision document, para 4.2). However, there is insufficient information in the Decision Document to determine whether the risks of the surfactants attracting and transporting

[1] Decision, 20 August 2018 on APP203594 (Foamstream V4)
[2] Staff Advice report, August 2018 on APP203594 (Foamstream V4)

hydrocarbons and other road surface contaminants was considered in the EPA's risk assessment. Similarly, the Staff Advice[2] report by the EPA, which contains more detail on the risk assessment undertaken, does not appear to consider this issue, nor does it provide any additional information on the formulation.

2.3 Definition of waterways

Paragraph 4.11 of the EPA decision document refers to use of Foamstream V4 to include "waterways (waste water site filter beds, clean water sites)." This refers directly to the description of use in the application (Table 5.1 of the application document). It is clear that the EPA does not intend for Foamstream V4 to be sprayed directly onto water, as indicated by the prescribed control (Clause 52 of the Hazardous Property Control or HPC notice) which requires that class 9.1 pesticides not be applied directly into or onto water.

2.4 Adverse effects including entrainment of other contaminants?

I note that the EPA Decision document states that "the surfactant foaming agents and other components of Foamstream V4 are all rapidly degradable, therefore should the diluted substances enter waterways or other environmental compartments, no significant effect on aquatic organisms, soil-dwelling organisms, and terrestrial vertebrates and invertebrates is expected" (para 4.13). This is consistent with the Unitary Plan requirement that "The discharge must not result in: (a) any concentration of agrichemical beyond the boundary of the site or into water that is likely to cause, significant adverse effects on human health, ecosystems or property." As stated above, however, it is not clear if the EPA considered the potential for the entrainment of road contaminants by the foam.

3. Consultant recommendations regarding risk assessment on the use of the product in the road corridor to human health, ecosystems or property.

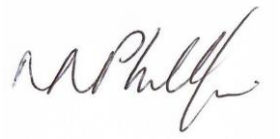
Foamstream appears to have been used in a wide range of applications in several countries, across a range of sectors and at various times throughout the year, as indicated by the case studies previously described. Many of these applications could have resulted in exposure of the foam to contaminants on surfaces.

In assessing the risks of the use of Foamstream, the EPA would have considered the potential for changes in risk associated with different climatic conditions, as well as different applications. It is not evident from the Decision Document that these factors affected the overall risk assessment, as this would have been reflected in the requirement for additional controls around use.

4. Recommendations on the product use within road corridor including any risk mitigation that needs to be included into operational practice.

I have found no evidence to indicate that the use of this product within road corridors, in accordance with the EPA controls, would lead to any more than a minor effects if it were to make its way into waterways. However, as it is not clear whether the EPA considered the potential for solubilisation (via micelle formulation) of road contaminants, it is not possible to recommend mitigations.

Yours sincerely



Dr Ngaire Phillips