Mont-Saint-Hilaire, Québec, February 19th 2023

To : Sierra Club Foundation

To whom it may concern,

I'm writing this letter in order to raise awareness of the importance of reusing organic waste on farmlands. I've been an environmental activist all my life, I sat on the board of the Quebec Chapter of the Sierra Club Foundation.

Land applying biosolids is the natural way to complete the food cycle. Recycling residual waste that still has strong fertilizing potential and when it meets the safety requirements, fits perfectly with the zero waste values, being an essential aspect of a circular economy. It is an act that has been practiced safely all over Europe since the 1980s with numerous studies demonstrating the many benefits (Evans, 2012).

There is a lot of fear surrounding this activity, but they are merely unfounded worries not backed by scientific data. According to the experts who have studied this practice for several years, the use of treated fertilizing cake is safe and is no riskier of damaging soils and humans than the use of untreated animal manures. If we could open a dialogue and educate on this matter, perhaps, little by little, we could minimize these fears. Research indicates that the major categories of contaminants in **fertilizing residual wastes pose very minimal risk** to human, animal and environmental health. This is because contaminants do not appear in high enough quantities to cause damage or are not absorbed by crops even when present in small concentrations in soils. (Beecher, et al, 2016)

It is also important to specify that the contaminants present in biosolids are also present in the environment. In addition, the dose applied is precisely low and is controlled by the guidelines at different levels of the government. Not to mention that when it comes to municipal biosolids, contaminants in fertilizing cake come primarily from our homes. A great deal of innovation has been done by the industry to minimize contaminants at the source solving many problems such as PCBs and dioxins and furans. Furthermore, work is always on going in this direction.

Anaerobic and aerobic digestion, the primary methods of treating biosolids, can effectively kill or deactivate viable pathogens, including parasites, viruses, and pathogens harboring genes with antibiotic resistance. When fertilizing cake is properly treated at the treatment plant, the digestion processes result in a nutrient-rich finished product. In fact, **Quebec has some of the most stringent regulations** (national and worldwide) concerning the quality and the disposal of fertilizing residual materials (Government de Québec, 2022).

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As a matter of fact, the application of **biosolids increases plant productivity**. It does this by providing nitrogen, phosphorus, potassium, zinc, organic matter and other essential nutrients for healthy plant growth not necessarily found in chemical fertilizers such as calcium and magnesium. It is a natural, renewable resource that can **reduce soil erosion** when organic matter binds to soil particles, retaining nutrients better than chemical fertilizers. This reduces the runoff of nutrients not absorbed by the soil and thus **improving water quality**. (Korzekwa, K. (2022)

There is also a large **reduction in greenhouse gas emissions associated with recycling fertilizing residual waste**. It sequesters CO2 from the air by increasing the organic carbon available in the soil, avoiding CH4 (methane) emissions related to the decomposition of biosolids at landfill sites under anaerobic condition where gas captation isn't perfect. It also reduces CO2 and N2O emissions coming from the production and application of chemical fertilizers. (Thorman, et al, 2009)

More and more, we hear the terrifying conversations surrounding PFAS, also known as the 'forever chemicals'. The term "PFAS" is the acronym for "Per- and PolyFluoroAlkylSubstances." Unfortunately, they are everywhere. While they are traces present in biosolids, they are also present in manure and unfortunately, in the rain and in the air. PFAS can be traced as far as Antarctica where there has never been any land spreading of biosolids nor compost. It is the concentrations of these PFAS that must be taken into account. There are 100 times more of these contaminants in our homes than there are in the fertilizing cake as shown on the figure below. They are found in dust, carpets, food packaging and in extremely high concentrations, in makeups, such as lipstick and foundation, which are absorbed directly into our skin. In fact, studies carried out in the industry show that the concentrations found in biosolids are actually **aligned with the average baseline amount** already present in the environment (Pinkerton, 2021). https://www.biocycle.net/a-dose-of-pfas-reality/

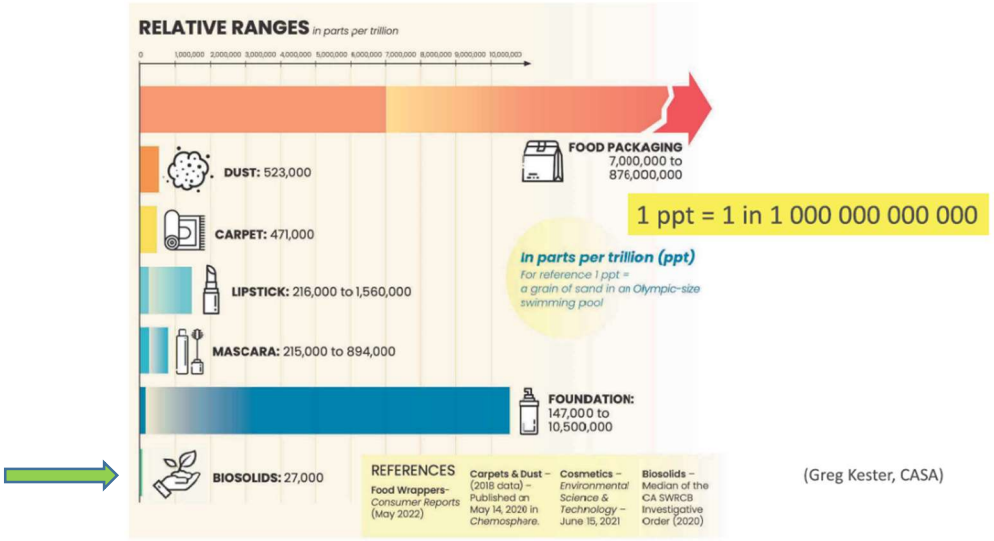

Figure 1 : Relative range of PFAS in various household items versus biosolids (ref CASA)

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The scientific experts of the industry have demonstrated that the land spreading of biosolids is a weak vector for displacing these contaminants in the environment. Even if we stopped all spreading tomorrow, the global net balance would not change. Biosolids are not the source of the problem, therefore banning it is not the solution. We can detect a significant decrease in the concentrations in the environment of certain banned PFAS since the regulatory restriction were put in place. The only real solution is to ban all non-biodegradable contaminants globally at the source (which is much easier said than done). It is important to understand that material containing these chemicals buried in landfills would contribute to the same problem at the end of the day; the same quantities of contaminants would leech into the ground, end up in the environment and eventually the oceans making the impact on humans the same (Pinkerton, 2021).

There are several sources of literature that explain the value of recycling fertilizing residual waste as well as studies on the long-term impacts to soils. According to the Canadian Water Network, "There's nothing so far to indicate that it is a problem, but the CWN is funding a series of research projects in any event, just to be certain". I highly encourage you to consult these documents for additional information that demonstrates the value of this circular cycle:

Connections: Targeting Organics Recycling Does Not Limit PFAS Exposure: https://www.biocycle.net/connections-targeting-organics-recycling-does-not-limit-pfas/

Therefore, may I ask the Sierra Club Foundation to stop the actual propaganda concerning the toxicity of compost and biosolids as these actions are having a negative impact on a highly ecological practice that is aligned with the sustainable development? Is the mission of the Sierra Club to fight for environmental justice?

Warm regards,

France Pellerin P.Eng
President
Andana services inc.

References:

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Also of interest:

BLOOM Webinar Covering Emerging Research on PFAS & Biosolids, January 2023

> Misconceptions abound about PFAS in the environment, including soils and biosolids. Bloom was excited to present the work of renown environmental microbiologist Dr. Ian Pepper, who has done groundbreaking research at the University of Arizona, on the fate and transport of pathogens in air, water, soils and municipal wastes this week. Click here to watch the recording. More information on biosolids & PFAS is available here.

PFAS And Organic Residuals Management: https://www.biocycle.net/pfas-organic-residuals-management/

Fluorinated Compounds in North American Cosmetics: https://pubs.acs.org/doi/10.1021/acs.estlett.1c00240

Is Anything Safe? Basics of risk assessment in the era of PFAS with Dr. Sally Brown: https://www.youtube.com/watch?v=6DA4V56J7rY&ab_channel=UF%2FIFASRangeCattleResearchandEducationCenter

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