Arlington Town Meeting — Motion to Amend

Article No. 12 **Dated:** 2023/05/04

I, Sanjay Vakil, do hereby submit the following Motion to Amend under Article 12:

To amend the Melofchik Substitute Motion by adding the following after point B as point C under "Moratorium":

C. This moratorium shall not apply to artificial turf that is considered “PFAS/PFOS free” according to REACH and PROP 65, shall be non-detect (ND) for 30 PFAS compounds tested via EPA Method 537 Modified, DoD/DOE QSM 5.1, or equivalent, and have a statement from the vendor that the turf does not contain and is not manufactured with PFAS/PFOA. Such measurement will be done by an independent laboratory not affiliated with the turf manufacturer.

Comment:

I acknowledge that a variety of PFAS have been found in artificial turf, and the EPA has linked exposure to PFAS, even in very small quantities, to increased risks for cancer, liver damage, and other negative health effects.

However my analysis (below) indicates that the exposure from artificial turf can be kept acceptably small if the turf is carefully chosen. Upon reviewing the documentation and research provided by the proponents of the Substitute Motion, I’ve come to two conclusions:

1. The exposure from “PFAS-Free” turf is acceptably low (as compared to water-borne exposure) in light of the benefits provided by additional fields.
2. The choice of which turf is critical because the exposure rate from different fields can vary dramatically – by a factor of 1000x or more. This amendment is designed to provide clear, actionable, prescriptive guidance on how to choose a field which has sufficiently low PFAS so as to make the incremental exposure negligibly small.

Respectfully submitted,

/s/ Sanjay Vakil, PhD

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Precinct 12

Date Voted: _____

Action Taken: _____

My Analysis:

I'm attempting to compare the exposure to PFAS from the water supply against a "PFAS-free" field. As I see it, if the incremental PFAS from artificial turf is significant relative to water ingestion, then I'm worried. If it is insignificant, I'm far less concerned. And I'm aware that this is a bioaccumulant; I'm assuming all exposure adds up.

At the EPA water limits, over the course of 10 years , you'll ingest a total ~4000liters of water and about 0.015 **micro**liters of PFAS (a microliter is 1 millionth of a liter; about 1/1000th the volume of a sugar cube)

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The city of Portsmouth had an article showing the measured rates in their (relatively new) artificial turf field. 135ppt (parts per trillion) is listed in the main article and I found it in the actual report as well.

By my math, to get the same amount of PFAS (0.015microliters), **you have to ingest 108kg of turf.**

The other mechanisms by which PFAS ends up in humans (breathing + skin contact) appear to be much smaller: 100x small.

The calculation continues to attempt to figure out how long it'd take to (naturally) ingest that much turf. Here I'm look at simple "dirt ingestion" which has been well studied. I expect that the value for dirt (~100mg/day) is probably too high; dirt is much easy to ingest and we don't spend all day on the fields. But for a rough calc, it is fine.

What this shows is that it'd take ~1500 years to ingest the same amount of PFAS as you'll get from water. From this, I'm concluding that we shouldn't worry about PFAS ingestion from artificial turf. It isn't that it won't happen, it is that it is far less of a concern than other PFAS sources.

PFAS water limit	4.00E-12	ppt (aka ng/L)	https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas
ingestion	10	years	
	365	days per year	
	4	cups per day	
	0.25	L/cup	
water in 10 years	3,650	L	
PFAS ingestion in 10 years	1.46E-08	L	
	0.015	microliters	
PFAS Turf Measurement	1.35E-10	ppt (aka ng/kg)	https://www.cityofportsmouth.com/sites/default/files/2022-06/Technical%20Memorandum_Portsmouth_Final.pdf
			https://www.eenews.net/articles/our-community-has-been-deceived-turf-wars-mount-over-pfas/
dirt ingestion to have same PFAS	108.15	kg	* assume dirt and water have similar densities.
(as water ingestion)			
Ingestion rate per day	200.00	mg/day	https://www.epa.gov/sites/default/files/2015-06/documents/efh_highlights_chap5.pdf
Days to ingest	540,741		
Years to ingest	1,481		