Department of Toxic Substance Control (DTSC)
Attn: Safer Consumer Products (SCP) Program 1001 I Street
Sacramento, CA 95814
Submitted via online portal at https://calsafer.dtsc.ca.gov/

Proposed Regulation: Carpets and Rugs with PFASs

Dr. Mr. Williams:
All PFAS containing products need to be banned. The plastics industry continues to impose risks to human and environmental health while developing more variations of the same class of chemicals, registering un or inadequately tested chemicals and products and unleashing them on the unsuspecting public.[1.] We must stop reinventing the wheel for every PFAS containing product and act decisively- Public and environmental health and safety demand it more now than perhaps ever before.

Whether used indoors or out, all PFAS containing carpet products, including synthetic, plastic grass carpets, as well as carpets used in all transportation vehicles, pose unacceptable health risks.

Synthetic grass carpets are used for both indoor and outdoor, commercial and residential applications. They are installed in childcare centers, gyms, spas, parks, yards, indoor athletic fields and more. Children and adults play on these surfaces sometimes on a daily basis while sports teams are exposed to these plastic carpets often for 2-3 hours/day, 3-6days/week.

PFAS containing plastic grass carpets present all of the same toxicological traits and adverse impacts to sub populations that conventional indoor carpets present. Indoor use has a higher risk for inhalation related injury and long term health consequences due to less ventilation in an enclosed space. Infants and young children bear a larger burden of risk to PFAS and other chemicals in these plastic carpets by virtue of their height and size relative to older children and adults.

Outdoor use, with exposure to elements, UV light and grinding action during play all cause these plastic grass surfaces to break down at a faster rate, hastening human and environmental exposure to PFAS, microplastics and additional toxins and carcinogens. They pose and increased the risk of dermal injury in the form of turf burns (caused by friction), and other heat, bacterial and toxicologically related illnesses. Both indoor and outdoor use of these products place athletic players at increased the risk of both MRSA[2] and Covid19, which can survive on inanimate surfaces for three[3] to nine days.[4]

Synthetic grass carpets create Heat Islands. They are always hotter than the ambient temperature when compared to natural grass, asphalt, concrete and bare soil and regardless of the infill product used. In a 2002 study at Brigham Young University, temperatures were taken 2 inches below playing surfaces, at 5'6" above surfaces and were also compared to concrete, asphalt and bare soil. At the 2" depth, the synthetic turf was 28°F higher. At the 5'6"height, synthetic turf was 37°F higher than asphalt and 86.5°F higher than natural turf. Irrigating the synthetic turf brought the temperature down from 174°F to 85°F. However, the temperature returned to 120°F within 5 minutes and 164°F within 20 minutes. The researchers found temperatures can reach 200° on a 98° day.[5] This is significant because a first degree burn occurs at 118°F in 15 minutes and becomes a third degree (full thickness) burn in 20 minutes. **When the surface temperature is 140ºF, a 1st degree burn occurs in 3 seconds and a full thickness burn in 5 seconds.**[6.] Additional studies have been widely reported regarding high temperatures on synthetic turf fields.[7-10]

Extreme examples of synthetic turf creating heat islands and impacting climate change are landfill and Superfund site closures with these plastic carpets. Three examples in California are[11]:

i) Crazy Horse Landfill,[11-14] Salinas, CA- 68 acres of synthetic grass carpet (995,520 sq.ft)
ii) George Air Force Base Landfill, Victorville, CA- 4 acres of synthetic grass carpet (58,560 sq.ft)
iii) Portola Landfill, Graegle, CA- 10 acres of synthetic grass carpet (146,400 sq.ft)

WaterShed Geo uses Agru America, Inc. and **Shaw Industries** for it's plastic grass closure turf.
To date, WaterShed Geo boasts **2,000 acres**[15](includes hydro closures) of Superfund and landfill closures across the US using these massive plastic PFAS coated/infused grass products. Countless more projects are planned.[16,17]

Conventional carpets used in residential and commercial applications are primarily made in Dalton, Georgia. This is also the location of most synthetic plastic grass manufacturing plants. Shaw Industries manufactures both conventional and plastic grass carpets. Additional examples manufacturers making both conventional and plastic grass carpets include NPC Inc. (Dalton, GA) , Astro Carpet Mills (Dalton, GA) and Tarkett (Lexmark Carpet and FieldTurf; Calhoun, GA).

Sampling of patents for synthetic turf show the intentional use of PFAS in manufacturing:

i) https://www.peer.org/wp-content/uploads/2019/10/US20080090955A1.pdf [0014]
ii) https://patentimages.storage.googleapis.com/a4/9c/a2/c1fb874999a5e6/US9963835.pdf Pg 10, 6, line 50, Right hand column
iii) https://patents.google.com/patent/CA2839965C/en?q=Artificial+turf&oq=Artificial+turf&page=4 #14

Confirmation of PFAS in synthetic turf has been documented in several recent studies (partial list):
Sept. 2019- Public Employees for Environmental Responsibility (PEER), Silver Spring, MD & The Ecology Center, Ann Arbor, MI:[18]

i) Oliver Ames High School, Easton, MA: "300 ppt of 6:2-Fluorotelomersulfonic acid (6:2 FTSA), a short-chain GenX PFAS, in the backing." Levels found were 20 times the state's proposed limit of 15 parts per trillion (ppt).
ii) C. 2004 discarded turf backing, Franklin, MA: 190 ppt of PFOS.
iii) 100% plastic grass fibers from 5 different fields, including leading manufacturers Shaw and TurfFactory Direct brands, revealed 44-255 ppm total fluorine
iv) 18 Oct 2019- results of SprintTurf testing done by RTI Laboratories, Inc., Livonia, MI
* SprintTurf Synthetic Grass Fibers, revealed the presence of PFAS[19]
* SprintTurf Synthetic Grass Backing, revealed the presence of PFAS[20]

Email communications with Susan Farris, Vice President of Sustainability & Corporate Communications at **Shaw Industries** and an anonymous inquirer confirmed Shaw Industries use of PFAS in their manufacturing of synthetic grass carpet:[21]

> OnWed, Oct 9, 2019 at 11:50 AM (name, contact info removed)
> *Thanks, Susan. Will you guys be eliminating PFAS in the artificial turf you manufacture as well? Can you say a bit more about what PFAS chemicals are used in producing your turf?*
>
> Susan Farris, Vice President of Sustainability & Corporate Communications at Shaw Industries stated (contact info removed)

Forwarded message ---------From: Susan Farris
Date: Wed, Oct 9, 2019, 6:32 PMSubject: Re: Shaw Inquiry regarding Turf
As new formulations are available to perform the same or similar functions as PFAS chemicals have historically, Shaw has shifted to new ingredients. We are exploring alternatives with our technical teams and suppliers but have not yet identified a substitute that provides the non-stick properties required for manufacturing synthetic turf.

This admission was published two hours later in The Boston Globe.[22]

Synthetic plastic grass has a lasting environmental impact. There are an estimated 12,000 to 15,000 synthetic grass fields in the US today with additional 1200-1500 being installed annually. In 2013, 365 fields were removed and 765 in 2018.[23] Thousands more are due to be removed in the next 1-2 years. There is no sustainable mechanism for recycling synthetic turf. At the end of it's useful life (warrantied typically for 8 years, last an average of 10years), these indoor/outdoor PFAS containing plastic carpets are either landfilled (approx. 495k pounds/field) resold, illegally dumped[24] or shipped overseas to other countries where they are unable to recycle them. Despite claims by the synthetic turf industry, contractors and other hired guns, the only "recycling" plant in existence is in Denmark.[25,26] In a phone call 6 May 2020 from GBN-AGR, Netherlands to a member of Safe Healthy Playing Fields Coalition (SHPFC, Maryland), it was confirmed they will be opening a recycling plant in approximately six weeks. They will only accept used synthetic turf fields from inside the Netherlands, where they have a massive problem with discarded rolls piling up[26] and even a massive fire of stored synthetic grass in Dongren, NL. It was stated they would not accept shipments from the US, citing an unsustainable system that increases emissions during removal, transport to a port and shipping overseas. In a separate phone call with Re-Match Recycling, Denmark, the same day, it was confirmed that they have no future plans for building a recycling plant in the US. Malaysia is another example of an unsustainable system that Target Technologies International Inc. claims to use. However, they are unwilling to provide information on a location, a company or any verifiable evidence that this actually occurs.[25] Multiple locations of used and discarded synthetic turf have been discovered within California, across the US and globally.

Waterways are impacted by runoff from plastic grass fields that drain into drainage systems tied into storm drains and leading to our oceans.[27,28] This includes toxic and carcinogenic leachate from breaking down plastic grass blades, the plastic backing, any associated infills (including plant based infills that add excess nutrients to the soil and runoff), and underlayment pads.

Whether over landfills, Superfund sites, in sports parks, backyards, or illegally dumped, plastic synthetic grass carpets off gas methane and ethylene. Methane is 21x more powerful than carbon dioxide. In studies comparing green house gas release by plastics in the water to plastics on land, when exposed to air, methane release is 2 times greater and ethylene 76 times greater when exposed to air versus than when in the ocean. Release of methane and ethylene is further compounded with synthetic plastic carpet because of the number of blades and additional components (backing, infill, under pad)- which make the total surface area (both sides of every blade) comprise an significantly larger area than the measurement of the playing field itself. Over time and with greater use, as the blades break down, the surface area becomes greater, increasing the toxic emissions further still. [29-31]

Sun, other environmental exposures and repeated grinding of the plastic blades, backing and under pad result in microplastics contributing their toxins and carcinogens to runoff, waterways, drinking water, oceans and the food we consume today.[28,32-34] Excess nutrients from plant based and other intentionally added microplastics in synthetic turf infills have been implicated in toxic algae blooms.[35,36] The frequency of red tides and toxic algae blooms have increased dramatically over the past decade.[37-39]

Microplastics compound the provide a means for sticky microalgae agglomeration by significantly slowing their descent to the seabed.[40] The effects of the current red tide, extending from Baja California to north of Los Angeles is evident while I write this letter- nearly 8 miles inland.

It is estimated that the average US citizen consumes the equivalent of a credit card's worth of microplastics annually…for those who play on plastic grass carpets, it is not unreasonable to suspect an even higher dosage through inhalation, ingestion, dermal and ocular exposure.

The cumulative effects on humans, domestic animals, livestock, wildlife, aquatic life, crop production, native plant life, and the effects of climate change brought on by virtue of direct and indirect exposure to synthetic plastic grass, WHEREVER it is found, warrants inclusion of these PFAS containing products for inclusion in a ban in California and elsewhere.

If not now, then when? If not you, then who? Are we willing to continue to endanger public and environmental health for those exposed to indoor/outdoor plastic grass carpets while protecting those who are exposed to conventional indoor carpets?

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Appendix A

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