



October 31, 2019

Sharon Standing Building Committee  
Community Center  
219 Massapoag Avenue  
Sharon, MA 02067

RE: Proposed Artificial Turf Field at Sharon High School

Dear Members of the Sharon Standing Building Committee,

The Sustainable Sharon Coalition and Plastic Free Sharon are strongly opposed to the installation of an artificial turf field at Sharon High School because of numerous environmental, health and safety concerns.

The Sustainable Sharon Coalition works to make Sharon a leading sustainable community. We promote and implement measures that conserve and sustain our community's use of natural and other resources to take part in the global effort to protect the health of our Town's residents and our planet. Plastic Free Sharon is dedicated to educating Sharon residents to the health and environmental hazards of plastic pollution.

Our organizations propose a two-year moratorium on artificial turf to give Sharon Town officials and residents the opportunity to learn more about the health and environmental hazards of artificial turf.

We are grateful that Sharon has decided not to use crumb rubber infill made from recycled tires, as that material contains carcinogens.<sup>1</sup> The choice to use BrockFILL is a marked improvement over crumb rubber. Nevertheless, the threats associated with artificial turf, especially at the location proposed at Sharon High School, far outweigh any benefits offered by artificial turf.<sup>2</sup>

**Environmental and Health Threats to the Town of Sharon**

As you know, the site of the football field at the High School is over and immediately adjacent to a sensitive wetland resource that is regulated by the Sharon Conservation Commission under Sharon's Wetland Bylaw and Wetlands Rules and Regulations, and the Massachusetts Department of Protection (MassDEP) under the state Wetlands Protection Act and Regulations. The water in those wetlands flows directly into natural resources including the Town's drinking water wells.

Synthetic turf contains toxic chemicals. The plastic blades are processed using per- and poly-fluoroalkyl substances (PFAS), a class of compounds that includes over 4,000 chemicals.<sup>3,4</sup> Industry experts indicate

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<sup>1</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6396308/>

<sup>2</sup> <https://www.peer.org/issues/public-health/artificial-turf/>

<sup>3</sup> <https://theintercept.com/2019/10/08/pfas-chemicals-artificial-turf-soccer/>

that these chemicals are commonly used by synthetic turf manufacturers as a non-stick agent in the manufacturing equipment, and that they are exploring alternatives with their technical teams but have not yet identified a PFAS substitute.<sup>5</sup> PFAS are a particular health threat, as they are highly persistent “forever chemicals” that never fully degrade and accumulate in our bodies and the environment.<sup>6</sup> Threatening levels of PFAS are measured in parts per *trillion*.<sup>7</sup> Concerns about the negative health impacts of PFAS have escalated over the last several years, with links found to increased risk of kidney and testicular cancer, thyroid disease, ulcerative colitis and high serum cholesterol levels.<sup>8,9</sup> Also, Sharon committees should be aware that the MassDEP is currently developing a drinking water standard (Maximum Contaminant Level) for PFAS and we do not yet know if our Town’s current water supply will be in compliance with the new regulations.<sup>10</sup>

The problems associated with artificial turf are not limited to PFAS contamination. The plastic carpet itself is treated with chemicals like flame retardants and biocides designed to limit bacterial infections. The turf blades are made of polyethylene, the same plastic used to make single-use plastic shopping bags, which are now being banned in Massachusetts cities and towns, including Sharon.<sup>11</sup> The proposed plastic turf carpet would contain about 40,000 pounds of polyethylene, the equivalent of 3.3 million plastic bags. Also, the shock pad (placed under the grass carpet) is approximately 1.5 inches thick and is made of another plastic polymer, polypropylene.

Constant exposure of the football field-sized plastic carpet to sunlight and heat, together with the wear and tear due to trampling, results in the release of plastic fragments that will be blown by the wind to surrounding wetlands and the lake and make their way into the watershed. Plastic pollution is currently a major concern because plastic does not biodegrade, thus the unnatural synthetic polymers persist essentially forever, becoming a permanent part of our ecosystems. Sunlight breaks down plastic fragments into smaller microscopic pieces, called microplastic. Because microplastic and plastic bind other hydrophobic toxins (e.g. pesticides, heavy metals), they become a concentrated source of toxins, even if the plastic itself is not toxic. ***Thus, an additional grave concern with the installation of a plastic carpet is potential contamination of our drinking water with PFAS, toxins and microplastics, as groundwater flows directly from the site of the football field toward three municipal water wells along Beaver Brook.<sup>12</sup> Together these 3 wells, of six that are active, pumped 253 million gallons in 2018, and provided 62% of our drinking water.<sup>13</sup>***

### Threats to Sharon High School Athletes

The synthetic turf industry has steadfastly claimed that their products are “safe,” however no widespread epidemiological studies have documented their safety.<sup>14</sup> In fact, players can absorb toxic

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<sup>4</sup> <https://www.peer.org/news/press-releases/industry-in-a-dither-about-pfas-in-synthetic-turf.html>

<sup>5</sup> [https://www.peer.org/assets/docs/epa/10\\_24\\_19\\_Shaw\\_Statement\\_on\\_PFAS\\_in\\_Turf.pdf](https://www.peer.org/assets/docs/epa/10_24_19_Shaw_Statement_on_PFAS_in_Turf.pdf)

<sup>6</sup> [https://news.northeastern.edu/2019/10/23/heres-what-you-need-to-know-about-pfas-the-forever-chemicals-in-your-food-water-and-air/?utm\\_source=News%40Northeastern&utm\\_campaign=a386726506-](https://news.northeastern.edu/2019/10/23/heres-what-you-need-to-know-about-pfas-the-forever-chemicals-in-your-food-water-and-air/?utm_source=News%40Northeastern&utm_campaign=a386726506-)

<sup>7</sup> <https://www.ewg.org/news-and-analysis/2019/02/pfas-drinking-water-hazardous-ever-lower-levels>

<sup>8</sup> <https://www.atsdr.cdc.gov/toxprofiles/tp200-c2.pdf>

<sup>9</sup> Nicole, W. PFOA and Cancer in a Highly Exposed Community: New Findings from the C8 Science Panel. [Environ Health Perspect.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855507/) 2013 Nov-Dec; 121(11-12): A340. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3855507/>

<sup>10</sup> <https://www.mass.gov/lists/development-of-a-pfas-drinking-water-standard-mcl>

<sup>11</sup> <https://plasticfreesharon.weebly.com/>

<sup>12</sup> Restoration and Revitalization Of the Sharon Great Cedar Swamp Progress Report, 2012, page 10. [https://www.townofsharon.net/sites/sharonma/files/file/file/sharongcs\\_progress\\_report\\_june2012absfinal.pdf](https://www.townofsharon.net/sites/sharonma/files/file/file/sharongcs_progress_report_june2012absfinal.pdf)

<sup>13</sup> MassDEP Public Water Supply Annual Statistical Report: 2018, pages 39-44, available upon request.

<sup>14</sup> <https://www.safehealthyplayingfields.org/industry-misinformation>

chemicals through their skin, by accidental ingestion, and by inhalation of dust and volatilized chemicals. The increased respiration rate of athletes results in increased intake of airborne chemicals and microplastic. Spectators, including children and pets, may sit on the sidelines of these fields, and could be impacted, as well.

The carcinogenic potential of artificial turf on athletes is supported by an unofficial study conducted by a University of Washington soccer coach who tallied the number of athletes who played on artificial turf and contracted cancer.<sup>15</sup> Her January 2019 list includes 260 young athletes with cancer, mainly blood-related cancers, which are the most heavily influenced by environmental exposures.<sup>16</sup> Most of the athletes who contracted cancer (203) were soccer players, and 59 percent of those were goalkeepers, even though goalkeepers account for a small number (10 percent) of the team players.<sup>17</sup> These reports are alarming and warrant further study of cancer rates in athletes with extensive body-to-turf contact during play.

Turf can also cause injuries. The plastic grass, even with the use of BrockFILL, can heat up to 100-160 degrees on hot days, causing dehydration, heatstroke, and blisters. According to the BrockFILL manufacturer, when the infill is dry, it is about 20 degrees Fahrenheit cooler than crumb rubber infill;<sup>18</sup> and crumb rubber can superheat to temperatures between 120-180 degrees Fahrenheit.<sup>19</sup> Turf burn abrasions are common, which increases the likelihood that athletes could be exposed to and absorb toxins into their bodies.<sup>20</sup>

In 2019, the American Orthopedic Society for Sports Medicine reported a study of concussion risk in nearly one million male athletes at 1,999 U.S. high schools. They found that turf outweighed all other mechanisms of injury, including helmet-to-helmet and grass, and concluded that nearly 90 percent of all head injuries occurred on turf-based surfaces.<sup>21</sup>

Members of the U.S. Women's soccer team have refused to play on artificial turf because of the high risk of abrasion injuries, and as a result, FIFA will not allow artificial turf at the 2023 Women's World Cup.<sup>22</sup>

The Safe Healthy Playing Fields Coalition<sup>23</sup> and the Toxics Use Reduction Institute at UMass Lowell have identified organic natural grass as the safest alternative for school playing fields.<sup>24</sup>

### **Economic Considerations for Sharon Taxpayers**

The ongoing cost to maintain an artificial turf field has been misrepresented by Sharon's Landscape Architects at Warner Larson. At a Sharon High School Building Project Community Meeting on September 24, 2019,<sup>25</sup> a Warner Larson representative advised that the synthetic turf should be

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<sup>15</sup> <https://www.doh.wa.gov/Portals/1/Documents/Pubs/210-091.pdf>

<sup>16</sup> <http://www.ehhi.org/turf-cancer-stats.php>

<sup>17</sup> <http://www.ehhi.org/turf-cancer-stats.php>

<sup>18</sup> <https://www.brockusa.com/brockfill-faqs/>

<sup>19</sup> <https://www.safehealthyplayingfields.org/heat-levels-synthetic-turf>

<sup>20</sup> <https://www.iberkshires.com/story/60561/Scientific-Evidence-Unclear-on-Risk-of-Artificial-Turf-Fields.html>

<sup>21</sup> <https://www.healio.com/orthopedics/sports-medicine/news/online/%7B095e875c-8c2c-4f31-8340-b0aaf576a4ce%7D/high-school-football-concussion-risk-greater-for-young-athletes-and-on-turf>

<sup>22</sup> <https://www.apnews.com/c54d2025b7c84ad982240d860b3a91dd>

<sup>23</sup> <https://www.safehealthyplayingfields.org/costs-grass-fields>

<sup>24</sup> [https://www.turi.org/Our\\_Work/Community/Artificial\\_Turf](https://www.turi.org/Our_Work/Community/Artificial_Turf)

<sup>25</sup> <http://www.sharontv.com/video/hs-forum-lights-and-turf/?fbclid=IwAR3m9HTJgtKMe4eaCwMVCUqVhpgYPrSP9gIJ6w6xkBeLzHRO8IFJiFpbEM>

replaced every 8 years due to breakdown of the plastic blades that make up the turf. This puts the cost of the artificial turf at \$1.63 million dollars for the first 8 years, compared to \$880,000 for natural turf. Currently, approximately 225 Sharon students use the athletic fields during the fall and spring seasons, thereby costing the town \$805 per athlete per year.

Warner Larson has not considered all life cycle costs in their estimates. First, is the fee for artificial turf disposal, which is required because there is currently no facility in the United States that recycles artificial turf. The most common method of artificial turf disposal is in a landfill or incinerator, both of which charge high tipping fees. Given that a turf carpet weighs on average 40,000 pounds, periodic increases in tipping fees, and our growing global plastic burden, fees for plastic disposal will likely be higher in 8 years.

Cleanup of microplastic pollution was also not considered in Warner Larson's cost estimates. The International Association for Sports and Leisure Facilities (IAKS) estimates that modern sport pitches release 250 to 300 kg of plastic per year, which could contribute 5,280 pounds of plastic to the surrounding area and wetlands over the 8-year life of the turf.<sup>26</sup> Furthermore, the problem of microplastic generation from this plastic debris is a recognized problem as IAKS recommends the installation of a filter system to collect microplastics in rainwater flowing from turf fields.

The architect also states that grass fields only provide 250 hours of play per year. In contrast, IAKS estimates that natural grass allows 400-800 hours of play.<sup>27</sup> And one of the nation's leading organic grass experts has provided case studies from Marblehead and Springfield, Massachusetts showing that organically maintained grass fields are being utilized over 1,000 hours per year – four times as long as the quotes provided by Sharon's landscape architects.

An additional economic consideration is that the Town of Sharon would bear all costs associated with installing, maintaining, replacing and disposing of an artificial turf field, which is significantly more expensive than a natural grass field. According to the Massachusetts School Building Authority (MSBA), "all costs associated with synthetic turf" are "categorically ineligible" for reimbursement by the state.<sup>28</sup> In contrast, the MSBA can potentially reimburse up to eight percent for natural turf.<sup>29</sup>

Detailed life cycle cost studies show organically maintained natural grass playing fields are by far the most cost effective and sustainable solution.<sup>30</sup>

### **Environmental Impacts Beyond Sharon**

In addition to the local threats a turf field poses to our wetlands, water supplies and athletes, plastic turf also has far reaching environmental perils. Microplastics and toxic chemicals can make fish, birds and wildlife sick, and can end up in the food chain.

<sup>26</sup> <https://iaks.sport/news/effective-rainwater-treatment-intercepts-microplastics-artificial-turf>

<sup>27</sup> <https://iaks.sport/news/effective-rainwater-treatment-intercepts-microplastics-artificial-turf>

<sup>28</sup> Page 2 of this document: [http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Documents/Guidelines\\_Policies/Site\\_Cost\\_Allow\\_Guidelines.pdf](http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Documents/Guidelines_Policies/Site_Cost_Allow_Guidelines.pdf) and Page 26 of this document: [http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Building\\_With\\_Us/Construction/Module%20%20-%20Construction%20Manual%20-%20081718.pdf](http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Building_With_Us/Construction/Module%20%20-%20Construction%20Manual%20-%20081718.pdf)

<sup>29</sup> Letter attached from Matt Donovan, MSBA. Page 1 of this document:

[http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Documents/Guidelines\\_Policies/Site\\_Cost\\_Allow\\_Guidelines.pdf](http://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Documents/Guidelines_Policies/Site_Cost_Allow_Guidelines.pdf)

<sup>30</sup> [https://www.turi.org/Our\\_Work/Community/Artificial\\_Turf/](https://www.turi.org/Our_Work/Community/Artificial_Turf/)

Also, synthetic turf pollutes the air and water and exacerbates climate change. Turf is made of polyethylene, which is produced from fossil fuels, and thereby a carbon emitter. In addition to the release of CO<sub>2</sub> during the manufacture of turf, a 2018 study found that all commonly used plastics release methane when exposed to ambient solar radiation, and of these, polyethylene is the most prolific methane emitter. Methane is a highly potent greenhouse gas, at least 25 times more potent than CO<sub>2</sub>. Given the large surface area and extensive exposure to solar radiation, an artificial turf football field will likely emit considerable amounts of methane, and thereby contribute to climate change.<sup>31</sup> Also, disposal of turf fields by incineration, in landfills, or illegally all contribute to air and water pollution.

For more information, please visit the website posted by the Safe Healthy Playing Fields Coalition,<sup>32</sup> and for the most up-to-date information visit their Facebook page.<sup>33</sup>

We appreciate the crucial need for sports fields for students, particularly during the Sharon High School construction phase. However, we believe that full disclosure to Sharon High School students, their parents and coaches, as to the hidden dangers of artificial turf to our students' health, air and water quality, and especially Sharon's drinking water supplies would likely dampen their enthusiasm for using toxin-containing plastic carpet, infill and shock pad, to solve the sports field problem. Sharon residents are connected to the natural world and interested in maintaining a healthy natural environment for our children and for our future. We believe the best choice is to have an organically maintained natural turf football field in our crucial wetland and watershed area. Also, we ask the Town to wait at least two years to better understand the problems of artificial turf before committing to such a non-reversible threat to our water supply.

Thank you for your consideration.

Sincerely,



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cc: Sharon Select Board  
Sharon Conservation Commission  
Sharon School Committee

<sup>31</sup> Royer S-J et al. Production of methane and ethylene from plastic in the environment. PLoS ONE 13(8): e0200574, 2018.  
<https://doi.org/10.1371/journal.pone.0200574>

<sup>32</sup> <https://www.safehealthyplayingfields.org>

<sup>33</sup> <https://www.facebook.com/SafeHealthyPlayingFields/>