



June 6, 2008

To: Councilmember Richard Conlin  
CC: Jackie Kirn, Mayors Office  
From: Timothy Gallagher, Superintendent  
Seattle Parks and Recreation  
Re: Use of Artificial Turf on Play Fields

This memo is in response to concerns presented by Council Central Staff in a memo to you dated May 5, 2008. The Department recognizes the current public debate over the risks of artificial turf and is aware of studies concluding there are potential health and environmental hazards in the use of artificial turf. However, there is also a large body of national and international research that has been commissioned by government health agencies, universities, independent laboratories, health and safety study groups and environmental organizations. Overwhelmingly, the most current research on newer generation artificial turf systems, such as those in Parks, conclude that the installation and use of artificial turf and the use of crumb rubber have no known health or environmental risks.

Much of the alarm regarding artificial turf arises from testing done in laboratory circumstances that simply break down the components of rubber. These studies most often do not reflect real life conditions and do not take into account natural processes in the environment. For instance, critics have raised alarm around polycyclic aromatic hydrocarbons (PAHs) found in synthetic turf. Laboratory tests have been conducted using organic solvents to extract the maximum amount of PAHs from rubber. However, PAHs are present in any carbon-based product and result from burning of fuels and cooking of foods. Studies have demonstrated that PAHs have an extremely low bioavailability and cannot enter the body without the use of a chemical solvent that is much stronger than water, sweat or digestive juices. The human digestive system is unable to break down these compounds. In the same way, the rubber cannot be absorbed by the lungs or the skin. While PAHs can be extracted from rubber through a limited extent, their low concentration poses no health risk from either oral or dermal exposure.

Lead is another compound found in older synthetic fields. Manufacturers utilized a nylon fiber material colored by a pigment that contained encapsulated lead chromate, a colorant commonly used in plastics. This was the case in the two New Jersey synthetic fields found to have high levels of lead in April 2008. Lead chromate is another highly insoluble compound with low bioavailability making it very difficult for the compound to be absorbed within the body. Newer synthetic turf does not contain any lead. In fact, after additional research, New Jersey elected to replace one of the old fields with a lead free nylon system.

In contrast to laboratory testing, several major research studies have been conducted by actually measuring chemicals at constructed synthetic turf fields. A joint study conducted by ALIAPUR (a French governmental agency responsible for regulating uses of used tires) and ADEME (the French Agency for Environment and Energy Management) installed a rain collection system that caught precipitation that had percolated through a synthetic turf field. The results of that study showed relatively low, but detectable concentrations of a number of organic compounds and metals. However, these concentrations were generally lower than the applicable drinking water standards.[3] This was true for all types of infill materials. In another study conducted in Norway, measurements were made of volatile organic chemicals (VOCs) in the air at indoor facilities containing synthetic turf fields. Their study included an assessment of risks from inhalation, skin contact and ingestion of tire crumb particles on adults, juniors and older children. Their conclusion was that recycled rubber granulate contains many chemical substances which are potentially harmful to health. However, the concentrations of these substances are extremely low and are only leached in very small quantities therefore not causing any elevated health or environmental risks.

Regarding concerns about synthetic turf creating heat islands, it is true that researchers have found that the surface temperatures of synthetic turf playing surfaces can be significantly higher than natural turfgrass surfaces when exposed to sunlight. However, irrigation of these fields dramatically reduces the surface temperature. Here in the Northwest, the concern about heat islands is a non issue. We do not irrigate our fields nor install irrigation systems. Synthetic turf fields are playable all year round in our moderate climate.

Research also indicates that synthetic field surfaces offer greater safety to users. As an example, a 5-year study of high school football teams conducted by West Texas A & M University published in The American Journal of Sports Medicine concluded that the types of injuries suffered on turf were less severe with quicker recovery time than those injuries suffered on grass.

Locally, a recent literature review conducted by D. Michael Johns, Ph.D. and sponsored by Bainbridge Island Metro Parks and Recreation District and the Bainbridge Island School District concluded that human health risks from playing on synthetic turf fields is minimal. As a result of this study, the Districts Fields Committee has recommended the use of artificial turf to the School Board.

Synthetic fields have gone through three generations of major research and improvements. Over the past four decades, professional sports teams have embraced early versions of artificial turf, then backed away from them, and then popularized them again as quality improved. All of Parks synthetic fields are the newest generation field systems.

With what we currently know, there are many advantages of using artificial turf. Thousands of tires are kept out of landfills and dumps. Artificial turf fields can stand up

to heavy use, require much less costly maintenance, eliminate the need for herbicides and pesticides, conserve water and remain open for play even after a Seattle downpour.

At this time, given the research and the benefits, the Department supports the use of artificial turf. However, I can assure you, the Department will continue to monitor this issue and to carefully examine any new research that may indicate possible risks to public health or the environment.

If you'd like to review the research, here are several links that may prove helpful:

**Artificial Turf: Environmental and Occupational Disease and Epidemiology**

[www.nyc.gov/html/doh/html/eode/eode-turf.shtml](http://www.nyc.gov/html/doh/html/eode/eode-turf.shtml)

**Are the Benefits Worth the Environmental and Health Risks?**

[http://www.childenvironment.org/pdf/turf\\_presentation.pdf](http://www.childenvironment.org/pdf/turf_presentation.pdf)

**Potential Health and Environmental Effects Linked to Artificial Turf Systems**

[http://www.iss.de/conferences/Dresden\\_2006/Technical/NBI\\_Engelsk.pdf](http://www.iss.de/conferences/Dresden_2006/Technical/NBI_Engelsk.pdf)

**A Survey of Microbial Populations in In filled Synthetic Turf Fields**

<http://cropsoil.psu.edu/mcnitt/microbial/discussion.cfm>

**Evaluation of Health Effects of Recycled Waste Tires in Playground and Track Products**

<http://www.ciwmb.ca.gov/Tires/Pubs.htm> (scroll to Research Papers)

**Initial Evaluation of Potential Human Health Risks Associated with Playing on Synthetic Turf Fields on Bainbridge Island**

<http://www.syntheticurfCouncil.org>

**Evaluation of Playing Surface Characteristics of Various In-Filled Systems**

<http://cropsoil.psu.edu/mcnitt/infill8.cfm>