

Fairfield Public Schools
Fairfield, CT 06825

TO: Dr. David Title and Members of the Board of Education
FROM: Thomas P. Cullen
DATE: January 6, 2015
RE: Artificial Turf Field Data

Attached please find some helpful fact sheets and information regarding our request for the Fairfield Ludlowe High School artificial turf field replacement in our proposed 2015-2016 Non-Recurring Budget request. I spoke to the Fairfield Director of Health and his recommendation was to review the State of Connecticut Department of Public Health reports and fact sheets which are very helpful. This will provide some information for you related to the health effects of the most common artificial turf fields being installed today.

If you have any questions or concerns regarding this information, please feel free to contact me at (203) 255-8373. Thank you for your continued support with the non-recurring projects for 2015-2016.

Thank you.

c: Meg Brown

Technical Fact Sheet • October, 2007

Health Questions about Artificial Turf Fields

Background

Cities and towns across Connecticut have increasingly opted for replacement of grass fields with a form of artificial turf that uses recycled rubber tires. The tires are processed into crumb rubber and used as an infill material to cushion the playing surface. Purported advantages over natural grass fields are reduced watering and maintenance, avoiding the need for pesticides, reduced injuries, and ability to play on the fields in a wider variety of weather conditions. However, the fields may not be maintenance-free and involve some grooming. Also, there are sources that recommend anti-static and antimicrobial treatments.

Questions have been raised regarding health, safety and environmental aspects of the rubber infill material (Brown, 2007). Rubber contains a variety of industrial chemicals that, in small quantities, can be released into the air during playing and which may run off into the environment in rainwater. This fact sheet focuses upon the potential health effects to athletes and spectators using these fields, many of who are school-age children.

What Chemicals Can Be Released By The Rubber Infill Material?

A mixture of particles and volatile chemicals can be released.

Rubber is a complex mixture of chemicals, some of which readily vaporize to form a gas (volatile organic chemicals or VOCs), while others remain in the solid-phase (e.g., metals, polycyclic aromatic hydrocarbons or PAHs). Given the variety and types of chemicals involved,

it is not surprising that some have toxic or carcinogenic activity when tested in laboratory animals. Studies at indoor soccer fields in Norway under active use conditions have shown that artificial turf can release numerous chemicals into the air, some as gases and others as particles. The VOCs included benzothiazole and toluene, while PAHs and phthalates were in the particles (Dye, et al., 2006). A laboratory study of vapor release from crumb rubber at the Connecticut Agricultural Experiment Station identified 3 additional chemicals (butylated hydroxyanisole, hexadecane, octylphenol) and traces of other unidentified constituents (CAES, 2007). California EPA evaluated the potential for chemicals to be absorbed into the body if the rubber were swallowed by children (CalEPA/OEHHA, 2007). They found that 22 chemicals leached out of the rubber when subjected to a gastric acid solution intended to simulate the human stomach. Thirteen different metals were leached with zinc and copper the most abundant. Organic chemicals were also extracted from the rubber with aniline and benzothiazole the most common. Benzene, toluene and PAHs were not found in the extract.

VOC release from crumb rubber infill would be expected to be greatest under sunny, hot weather conditions and the surface of artificial fields is known to become hotter than the ambient air. Temperatures of 150F or higher have been found under these conditions (McNitt, 2007). Particle release is expected to be affected by the number of athletes using the field at any given time, their body weight and the intensity of their exercise. Weather conditions such as temperature gradients and wind will affect gas and particle concentrations in the breathing zone of athletes; in general this is 3-6 feet above the surface. Temperature studies done by Pennsylvania State University indicate the rapid dispersal of heat with height above the fields with measurements 3 feet above the surface 40-60F less than the surface temperature (McNitt, 2007). This rapid atmospheric mixing suggests that VOCs emanating from the surface will also rapidly dilute and that the main potential for exposure is during brief periods where athletes are lying flat on the ground. Indoor fields will have less dilution effect (less wind and temperature gradient) and measurements at indoor soccer fields in Norway (height above field not specified) found a variety of rubber-related VOCs (Dye, et al., 2006).

How Can People Be Exposed To Rubber Chemicals At Artificial Turf Fields?

Inhalation and ingestion exposures are possible.

Athletes using the fields can be exposed to VOCs and particles released from the rubber infill. Because their play may create airborne particles and because of their high ventilation rate, athletes are expected to receive the greatest exposure. As shown in the Norway indoor field study (Dye, et al. 2006), these particles can be in the respirable dust (<10 micron) range and can exist at concentrations of 1-10 microgram per cubic meter (ug/m³), which is somewhat higher than the urban background estimated for Los Angeles rubber dust (1-2 ug/m³) (Miguel, et al., 1996). Athletes may also inadvertently ingest dust particles that cling to the hands and clothing.

Those watching from the sidelines or grandstands will receive lower exposures to the particles and VOCs released by the rubber. It is also possible that if young children accompany parents to these fields, they may swallow the infill material itself, although the ingestion of whole granules is not likely to be a frequent occurrence. This possibility may increase if artificial turf fields are placed at elementary schools and playgrounds that have playscapes.

Since the particles cling to shoes and clothing, it is also possible for the infill material to be tracked into cars and homes after leaving the field. This can lead to some ongoing exposure to the athlete and other household members, as the particles become part of house dust. This is expected to be much less exposure than from the fields themselves.

Are People Exposed To These Chemicals In Other Ways?

Yes.

Most of the chemicals emitted from the rubber granules are quite common in urban and suburban air. Part of the reason is that car and truck tires are constantly being worn down and release a similar array of gases and particles as can be released from crumb rubber. These chemicals are not just near roadways but spread around and become part of the background air. For example,

roughly 1-2% of the respirable dust in Los Angeles is estimated to come from the wearing of tires (Miguel, et al., 1996).

Other sources for these chemicals are also quite common. For example, outdoor air contains PAHs from car exhaust and home furnaces, while indoor air and consumer products can be a source of chemicals found in rubber: benzothiozoles (carpet padding, rubber-based flooring, wine, food flavorings – Bellavia, et al., 2000), latex allergens (rubber bands and latex gloves), phthalates (cosmetics, flooring), toluene (solvent in glues and other consumer products), butylated hydroxyanisole (food preservative), hexadecane (food packaging), and PAHs (wood smoke, char-broiled meat). A California study found that benzothiazole off gases from rubberized flooring that is commonly used in schools and estimated indoor air concentrations up to several hundred ug/m³ (California Integrated Waste Management Board, 2003).

Rubber matting is commonly used beneath play equipment so that children have played on rubber surfaces for many years. However, the shredded nature of the tire crumbs causes a greater potential for exposure than is likely from intact rubber surfaces.

Thus background sources of exposure to the chemicals present in rubber infill are common and expected to be more continuous and at times greater than what is possible from playing on artificial turf fields. Possible exceptions to this are: 1) the ingestion of the infill material itself by small children, although this would be expected to be a one-time or sporadic event; 2) the contamination of the home environment with rubber granules and dust, which could lead to an ongoing, low-level exposure.

Is There A Health Risk?

Based upon the current evidence, a public health risk appears unlikely. DPH does not believe there is a unique or significant exposure from chemicals that can be inhaled or ingested at these fields. However, there is still uncertainty and additional investigation is warranted.

Any risk assessment on chemical exposures from artificial turf fields will be limited by the fact that exposure pathways are still not well characterized and that for some chemicals, the

toxicology database is incomplete. A potential concern is the possibility of respiratory irritation and instigation of an asthma attack. Asthma is already a concern in youth sports, especially in hot weather. One of the main chemicals that can off gas from the rubber, benzothiazole, is an irritant and particulate matter and latex allergens are potential asthma triggers. Concerns have also been raised regarding cancer risks given that rubber contains PAHs, certain of which are carcinogenic. However, when judged within the context of background exposures to these chemicals as well as risk assessments conducted by other regulatory bodies, artificial turf fields do not appear to be a significant risk factor for asthma or cancer.

Several governmental bodies have reviewed the potential exposures and risks from the chemicals that can be released from artificial turf. The Norwegian government conducted a quantitative risk assessment based upon the data described above from several indoor turf fields and a review of the available toxicology data (Norwegian Inst Public Health, 2006). They used reasonably conservative assumptions for contact rates via inhalation and ingestion of pellets by athletes. Their analysis found no elevated health risks. They cautioned that their assessment was incomplete in several areas, particularly due to incomplete toxicology data and regarding the potential exposure to latex allergens. The Swedish government issued a qualitative review of health risks and leaching potential to the environment and also determined that the risk to public health was not a concern (KEMI, 2006). However, from a pollution prevention perspective, they recommended against new installations of artificial turf. Risk evaluations by the French government and by the State of NJ similarly did not find threats to public health with the NJ white paper concluding that there was no obvious toxicological concern raised by crumb rubber in its intended outdoor use (Moretto, 2007; LeDoux, 2007). The California EPA/OEHHA risk assessment of children ingesting 10 grams of rubber pellets on a one time acute basis did not find an elevated health risk (CalEPA/OEHHA, 2007). Other groups have done their own assessment and found concerns due to the types of exposure possible (Brown, 2007).

It is also important to consider possible exposures in relation to background sources of the chemicals that can be released from the rubber infill. While this type of comparison is still limited, we do know that there is frequent and considerable background exposure to particulate matter, PAHs, latex allergens and phthalates in outdoor air, consumer products, food and the

indoor home environment. Some of this exposure comes from rubber itself as the wearing of tires is a significant contributor to air pollution.

Exposures to benzothiazole and other VOCs at artificial turf fields are expected to be low as off-gassing in cool weather may not be great and off-gassing in hot weather will be more significant but may be readily diluted with height above the field due to wind and as the heat from the field disperses. However, careful measurements of this have not been made.

While DPH does not believe there is a unique or significant health threat from chemical releases that can be inhaled or ingested, the uncertainties warrant further investigation.

Should Towns Continue To Install This Type Of Artificial Turf Field?

DPH's review does not find any reason to stop installation of these fields.

Currently there are no federal or state limits on the installation of crumb rubber-based turf fields. Therefore, it is up to towns to make a case-by-case decision on whether artificial turf is the right choice for a particular setting. DPH's review of the existing literature does not find any reason to stop installation of these fields, but acknowledges that much of this information is very recent and this area is rapidly evolving. Additionally, the potential exposures and risks have not been fully characterized. DPH recommends that towns consider these uncertainties as part of the array of issues evaluated when deciding whether to install artificial turf fields (e.g., cost, maintenance, public acceptability).

Where Can I Get More Information?

Health Questions? Contact the Environmental and Occupational Health Assessment unit at CTDPH at 860- 509-7740

References

Bellavia, V., Natangelo, M, Fanelli, R and Rotilio, D (2000) Analysis of benzothiazole in Italian wines using headspace solid-phase microextraction and gas chromatography-mass spectrometry. *J Agric Fd Chem* 48: 1239-1242.

Brown, D. (2007) Exposures to Recycled Rubber Tire Crumbs Used on Synthetic Turf Fields, Playgrounds and Gardening Mulch. Available at http://www.ehhi.org/turf/pr_turf_report.shtml.

CAES (Connecticut Agricultural Experimental Station) (2007) Examination of Crumb Rubber Produced from Recycled Tires. AC005 – 8/07.

CalEPA/OEHHA (2007) Evaluation of Health Effects of Recycled Waste Tires in Playground and Track Products. Prepared for the California Waste Management Board, January, 2007.

California Integrated Waste Management Board (2003) Building Material Emission Study. Available at <http://www.ciwmb.ca.gov/Publications/GreenBuilding/43303015.doc>.

Dye, C., Bjerke, A., Schmidbauer, N. and Mano, S. (2006) Measurement of Air Pollution in Indoor Artificial Turf Halls. Norwegian Inst Air Res Report NILU OR 03/2006.

KEMI (Swedish Chemicals Agency) (2006) Synthetic Turf from a Chemical Perspective – A Status Report. Available at http://www.kemi.se/upload/Trycksaker/Pdf/PM/PM3_06_eng.pdf

LeDoux, T (2007) Preliminary Assessment of the Toxicity from Exposure to Crumb Rubber: its use in Playgrounds and Artificial Turf Playing Fields. New Jersey Department of Environmental Protection, Division of Science, Research and Technology

McNitt, AS (2007) Evaluation of Playing Surface Characteristics of Various In-filled Systems. Penn State University. Available at <http://cropsoil.psu.edu/mcnitt/infill.cfm>.

Miguel, AG, Cass, GR, Weiss, J and Glovsky, MM (1996) Latex allergens in tire dust and airborne particles. *Environ Health Perspect* 104: 1180-1186.

Moretto, R (2007) Environmental and Health Evaluation of the Use of Elastomer Granulates (Virgin and from used Tyres) as Filling in Third-Generation Artificial Turf. ADEME/ALIAPUR/FIELDTURF TARKETT

Norwegian Inst of Public Health and Radium Hosp (2006) Artificial turf pitches – an assessment of the health risks for football players.



FACT SHEET

Connecticut Department of Public Health
 Environmental & Occupational Health Assessment Program
 Environmental Health Section
 410 Capitol Avenue, MS # 11EOH, PO Box 340308
 Hartford, CT 06134-0308
 Telephone: (860) 509-7740 Fax: (860) 509-7785
<http://www.ct.gov/dph/>

August 2010

The CT DPH Risk Assessment of Artificial Turf Fields



Background

A new study of artificial turf fields containing crumb rubber infill has just been completed through a joint agreement between the CT Department of Environmental Protection (DEP), the University of Connecticut Health Center (UCHC), the CT Agricultural Experiment Station (CAES) and the CT Department of Public Health (DPH). The table below shows the main areas of responsibility for each of these participating agencies. This fact sheet focuses upon the risk assessment performed by DPH which draws upon the UCHC findings from five fields tested in Connecticut in July 2009. The overall report containing each of the individual agency reports can be obtained at www.ct.gov/dep/artificialturf. Also shown in the table is the fact that the Connecticut Academy of Science and Engineering (CASE) reviewed a draft of these reports and their comments were incorporated into the final reports.

Components of the State of Connecticut Artificial Turf Study

Agency	Activity	Methods
DPH	Human health risk assessment	Convert air concentrations measured by UCHC to the level of health risk to users of the fields from inhaling emitted chemicals
UCHC	Human exposure field investigation	Measured air concentrations of approximately 200 chemicals at 5 fields during active play
DEP	Environmental field investigation	Measured leaching of metals from fields during rain events
CAES	Laboratory study	Measured offgasing and leaching of chemicals from crumb rubber under defined laboratory conditions
CASE	Document review	Assembled 9 member expert panel to review all aspects of the State of CT reports on artificial turf fields

Why This Study

Some Connecticut municipalities have opted for or are considering artificial turf fields to replace natural grass fields. The most common type of field to date uses recycled rubber from tires as a crumb rubber infill to cushion the playing surface. Advantages over natural grass fields are reduced watering and maintenance, avoiding the need for pesticides, reduced injuries, and ability to play on the fields in a wider variety of

weather conditions.

Questions have been raised regarding health, safety and environmental aspects of the rubber infill material. Rubber contains a variety of industrial chemicals that, in small quantities, can be released into the air on warm days and from sports activities on the fields. Previous studies in Europe and the United States have tested a limited number of fields for the release of chemicals of potential concern (COPCs). The current study was designed to evaluate outdoor and indoor fields in Connecticut for airborne chemicals that are emitted from the crumb rubber under summertime active play conditions. The artificial grass blades were also tested for lead content due to concerns raised in New Jersey that the plastic blades can contain lead. This study enhances the database on crumb rubber fields by increasing the number of fields tested, by evaluating an indoor field, something that has not previously been done in the US, by using personal monitoring techniques to better assess the exposure of players on the fields, and by expanding the risk assessment by focusing on acute health risks in general and benzothiazole, in particular. Benzothiazole is the main chemical that vaporizes from the crumb rubber.



What Was Done

A. The Field Investigation

UCHC sent a team of researchers to four outdoor fields and one indoor field spread across CT. Sampling occurred on warm, sunny and low wind days in July 2009. Sampling equipment was set up on the field as well as at upwind background locations to determine what was coming off the field. Three soccer players at each field were equipped with personal monitoring devices and these results together with the stationary samplers (on field and background) were used to characterize the possible exposures. Overall, approximately 200 chemicals were tested for at each field including 60 volatile organic chemicals (VOCs), 22 polycyclic aromatic hydrocarbons (PAHs), 7 nitrosamines, 5 specially targeted rubber-related chemicals, 93 miscellaneous air pollutants, lead and particulate matter (PM₁₀). The samples were sent to a laboratory in Wisconsin that is capable of detecting even very small amounts of chemicals in air samples. In addition, bulk samples of crumb rubber and turf fibers were analyzed for lead by a laboratory in Connecticut.

B. The Risk Assessment

DPH reviewed the UCHC data to identify chemicals that were coming from the field rather than from background sources of air pollution. Any chemical found to be 25% higher on the field than upwind was considered to be field-related. A total of 27 COPCs were identified on this basis and run through the human

health risk assessment. The table below shows the four hypothetical exposure scenarios evaluated. The outdoor fields were combined into one assessment by using the highest concentration of each chemical found at any of the outdoor fields to represent what is possible regardless of where it was found. The indoor field was analyzed separately because conditions indoors and outdoors were considerably different. Two different groups were analyzed, children aged 6-18 and adults. The greater breathing rate associated with active sports was incorporated into exposure equations for children and adults.

Exposure Scenarios Analyzed in DPH's Risk Assessment

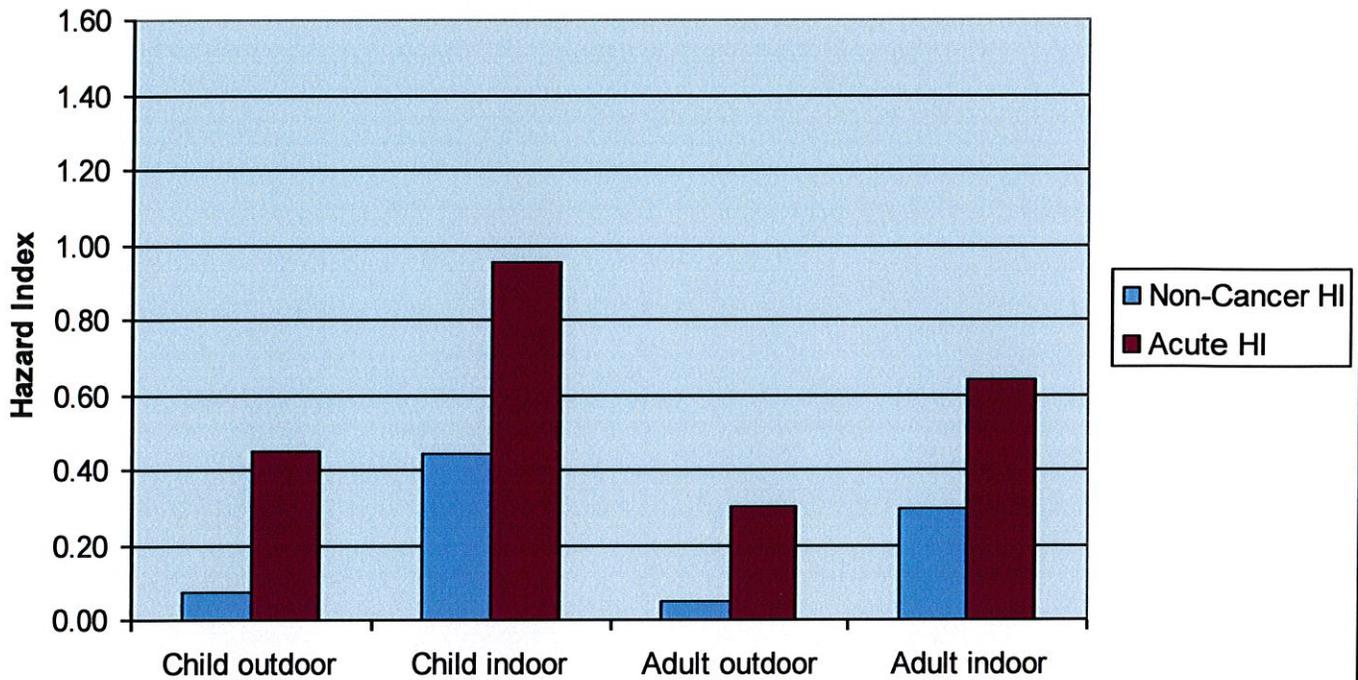
Field Type	Exposure Group	Exposure Frequency
Outdoor	Child 6-18 yr old	3 hr/day, 138 day/year, 12 yr
Outdoor	Adult	3 hr/day, 138 day/year, 30 yr
Indoor	Child 6-18 yr old	3 hr/day, 138 day/year, 12 yr
Indoor	Adult	3 hr/day, 138 day/year, 30 yr

The DPH risk assessment represents a screening analysis in which high end assumptions were used for the amount of exposure possible from playing on the fields. Our worst case approach included the use of the maximum detection found at any field across all chemicals, assessing risks for benzene and methylene chloride even though they were only detected in the personal monitors and thus may not be coming from the fields, and the use of sunny low wind conditions to represent every day of playing. A screening level risk assessment is used to determine whether there is the potential for elevated risks when using worst case assumptions. If this is not the case, no further analysis is needed.

What Did We Find?

Risk estimates were not elevated into a range of health concern for cancer or non-cancer endpoints for children or adults at the outdoor fields. Risk levels were somewhat higher indoors because the concentrations of benzothiazole and naphthalene were greater indoors. These risks were still below a health concern (see Figure below) but the acute risk to children playing indoors is borderline (Hazard Index almost 1) resulting in a greater amount of uncertainty over whether an adverse effect is possible. The theoretical concern is an acute irritation response from benzothiazole and other volatile compounds released from crumb rubber indoors. The indoor field tested had no ventilation which presents a worst case condition. Regarding the potential concern raised in New Jersey over lead in the crumb rubber or blades of artificial grass, the UCHC results showed that lead levels were low and not a health concern at the five fields tested.

Hazard Indices for Non-Cancer and Acute Risk at Artificial Turf Fields



(The Hazard Index is the ratio between actual exposure and the safe exposure level; an index below 1 signifies no increase in risk)

Another area of uncertainty is that this study did not evaluate newly installed fields under peak summer heat conditions. UCHC tested a range of newer (less than 2 years old) and older fields. However, the CAES data demonstrate that crumb rubber rapidly ages and emits much lower levels of chemicals after several weeks of being outdoors. Thus it is possible that greater exposures on outdoor fields are possible if the rubber infill is brand new during the summer months. Since this exact scenario was not tested, its health implications are unknown although if there was a risk, it would be short lived.

CASE Review

The main areas of CASE comments were that 1) the cancer risks calculated by DPH may have been overestimates because of the inclusion of benzene detections that are likely not coming from the playing field but from the players themselves; 2) the uncertainty with respect to the benzothiazole risk assessment since so little toxicology data are available for benzothiazole; and 3) the potential for allergic reactions to occur due to the presence of latex antigen in natural rubber. To address these comments, the risk assessment

describes the issues and finds that they do not change the overall conclusions and are unlikely to present added risk. For example, the public is commonly exposed to rubber particles in street dust without obvious reactions to the latex in these particles, so this does not appear to be a major risk at crumb rubber fields. Nevertheless, those who think they are experiencing an allergic reaction to the fields (skin rash, breathing difficulty) should report this to their doctor and to local health officials.



What Does It All Mean?

Outdoor Fields: DPH's assessment finds no health concern from inhaling chemicals at outdoor crumb rubber fields. It is important to note that these fields are typically hotter than natural grass fields and so summer users of these fields should take added precautions to avoid heat exhaustion (more frequent rest breaks, hydration). Further, it would be best to install new crumb rubber in cooler months to avoid the peak exposure that might occur with fresh rubber in hot weather.

Indoor Fields: DPH's assessment finds that exposures can be considerably greater indoors than out and this creates an uncertainty in terms of the potential for acute risks for children playing indoors. It is prudent for building operators to ventilate the indoor fields to decrease these exposures. The level of ventilation needed will vary from field to field. New indoor fields should consider alternatives to crumb rubber infill as a cushioning agent.

While allergic reactions on the skin or in the lungs are not anticipated from outdoor or indoor fields, anyone experiencing such reactions should report the incident to their doctor and the local health department.

Limitations And Relationship To Other Studies

Like all scientific studies, our evaluation of artificial turf fields has limitations. It did not specifically evaluate the risks from dermal exposure or ingestion of the crumb rubber, two pathways which are expected to be of lower concern and have received some attention in previous studies. The data are still from a small number of fields and days of sampling. Finding VOCs such as benzene only in personal monitoring samples raises questions about the utility of those data that could not be resolved in the current study. The default

approach was to include the questionable data for this screening level risk assessment. The potential for allergic reactions at these fields was not a focus and in general is difficult to analyze.

While there are still some uncertainties with crumb rubber fields, they have been tested more than many other products. Neither the testing done here in Connecticut nor that done by New York City, New York State, California, USEPA or the Norwegian government have found data supporting a health concern, especially at outdoor fields where exposures are generally lower than what has been found at indoor fields.

Where To Get More Information:

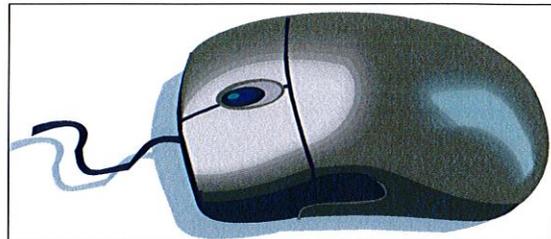
Previous DPH fact sheets on crumb rubber provide more background on the issue and can be found at:

- ◆ [http://www.ct.gov/dph/lib/dph/environmental_health/pdf/artificial_turf_\(2\).pdf](http://www.ct.gov/dph/lib/dph/environmental_health/pdf/artificial_turf_(2).pdf)
- ◆ http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/artificial_turf_tech_fs_10-07.pdf

⇒ For health questions contact DPH at 860-509-7740.

⇒ For questions about the UCHC study contact UCHC at 860-679-4634.

⇒ For questions about the environmental aspects of artificial turf fields contact DEP at 860-424-3867.



Cullen, Thomas

From: Cleary, Sands <SCleary@fairfieldct.org>
Sent: Wednesday, January 21, 2015 4:08 PM
To: Cullen, Thomas
Subject: FW: Artificial Turf Update
Attachments: 2015-02 Recent News Concerning Artificial Turf Fields.pdf

Just as an FYI, here is some info and a video send out by DPH today regarding no risks being associated with turf fields

From: CTDPHHealth_Alert_Network@ct.gov [<mailto:conf-1837662228@everbridge.net>]
Sent: Wednesday, January 21, 2015 1:26 PM
To: Cleary, Sands
Subject: Artificial Turf Update

[Please click here to acknowledge receipt of this message](#)

The following is a message from CT-Department of Public Health:

Dear Local Health Director -- We are resending a circular letter regarding artificial turf fields from June 6, 2014 because some local health departments are being asked to weigh in on safety concerns related to these fields. These concerns largely stem from recent new stories highlighting a theoretical cancer risk in soccer goalies. We have added a new feature to this circular letter: a brief video clip that gives the basic message from DPH. Please review the attached letter/clip and let us know if you need more information on artificial turf fields.

Brian Toal, Supervising Epidemiologist 4
Gary Ginsberg, Toxicologist
Environmental and Occupational Health Assessment Program
860-509-7740

If you have received this notification in error, please reply to:
Ctdphhan@ct.gov

Notice: This email message, including any attachments, is for the sole use of the intended recipient(s). If you are not the intended recipient, please contact the sender by reply email and destroy all copies of the original message. Please note that messages may be subject to the Connecticut Freedom of Information Act and to the confidentiality provisions of the Family Education Rights and Privacy Act. (FPSdisclaimerv123)

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH



Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

**EHS Circular Letter #2015-02
(Follow up to Circular Letter #2014-26a)**

DATE: January 20, 2015
TO: Local Health Departments and Districts
FROM: Brian Toal, Gary Ginsberg
Environmental and Occupational Health Assessment
RE: Recent News Concerning Artificial Turf Fields



Brief Video Clip for Local Health Departments – *Click Here* →

This letter and video clip are being sent to update you regarding the news story that has circulated since last spring regarding potential cancer risks at artificial turf fields. Various media outlets have continued to run this story and a number of local health departments have inquired as to its validity. Since many Connecticut towns have installed or are considering artificial turf fields an elevated cancer risk would be an important consideration. However, this news story is still based upon very preliminary information and does not change CTDPH's position that outdoor artificial turf fields do not represent an elevated health risk.

The Connecticut Department of Public Health has evaluated the potential exposures and risks from athletic use of artificial turf fields. Our study of 5 fields in Connecticut in 2010-2011 was a comprehensive investigation of releases from the fields during active play. This study was conducted as a joint project with the CT DEEP and the University of CT Health Center and was peer-reviewed by the Connecticut Academy of Science and Engineering. Our study did not find a large amount of vapor or particle release from the fields confirming prior reports from Europe and the US. We put these exposures into a public health context by performing a risk assessment. Our risk assessment did not find elevated cancer risk. These results have been published as a set of 3 articles in a peer review journal and are available on the DPH artificial turf webpage (<http://www.ct.gov/dph/cwp/view.asp?a=3140&q=464068>).

The news story suggests soccer players and especially goalies may have an elevated cancer risk from playing on artificial turf fields. This is based upon anecdotal observations of a university soccer coach (<http://www.komone.com/news/local/Soccer-coach-Could-field-turf-be-causing-cancer-259895701.html>). Reportedly the coach is developing a list of soccer players who have contracted cancer. However, the types of cancer are undocumented and so it is impossible to say whether they



Phone: (860) 509-7740 • Fax: (860) 509-7785 • VP: (860) 899-1611
410 Capitol Avenue, P.O. Box 340308
Hartford, Connecticut 06134-0308
www.ct.gov/dph

*Affirmative Action/Equal Opportunity Employer and Provider
If you require aid or accommodation to full and fairly enjoy this publication,
please phone (860) 509-7293*

represent a common effect and there has been no reporting on how long the goalies played on artificial turf fields to see if there was plausible exposure and latency. There are many reasons why someone collecting a list of cancer cases may appear to find a cluster including the fact that when you have a single-minded focus on finding cases you do not capture all the non-cases that would tend to disprove the cluster. Documentation of an increased rate in soccer players would require an epidemiological study in which the total number who play on turf fields in a given region was also known so that a cancer rate could be established and compared to those that do not play on artificial turf fields. The current news report does not constitute epidemiological evidence and thus is very preliminary.

Our risk assessment did cover carcinogens that are known to be in recycled tires and the crumb rubber used to cushion fields. Once again, we found there to be very little exposure of any substances, carcinogenic or not, in the vapors and dust that these fields generate under active use, summer conditions. Background levels of chemicals in urban and suburban air from heating sources and automobile traffic are much more significant sources of airborne carcinogens. The fact that we sampled 5 fields (4 outdoor and 1 indoor) of different ages and composition suggests that the results can be generalized to other fields, a conclusion supported by the fact that results were similar to what was found in California, USEPA and European studies. Our study did not evaluate ingestion of the crumb rubber itself as players are unlikely to ingest an entire rubber pellet. However, two studies, one in California and one at Rutgers University did evaluate the cancer risk if children ingested a mouthable chunk of playground rubber (10 gram), using laboratory extraction methods to estimate the amount of chemicals that might become available in the stomach and absorbed into the body. Both studies found very low cancer risk from this scenario (Cal OEHHA 2007; Pavilonis et al. 2014). Thus, CT DPH finds no scientific support for a finding of elevated cancer risk from inhalation or ingestion of chemicals derived from recycled tires used on artificial turf fields. US EPA has a similar position: "At this point, EPA does not believe that the field monitoring data collected provides evidence of an elevated health risk resulting from the use of recycled tire crumb in playgrounds or in synthetic turf athletic fields." (<http://www.epa.gov/epawaste/conservation/materials/tires/health.htm>)

In summary, federal and state authorities have taken seriously the concerns that artificial turf fields may present a health risk due to contaminants in recycled rubber. The best way to investigate these concerns is via an exposure investigation. Studies conducted in Connecticut and elsewhere have shown a very low exposure potential, less than from typical outdoor sources of air pollution. The current news reports of a list of soccer players with cancer does not constitute a correlation or causality and thus raises a concern that currently lacks scientific support. Thus, the CT DPH position expressed in 2011 at the conclusion of the Connecticut study, that outdoor artificial turf fields do not represent an elevated health risk, remains unchanged. For further information please contact Brian Toal or Gary Ginsberg at 860-509-7740.

References

- California OEHHA 2007. Evaluation of Health Effects of Recycled Waste Tires in Playground and Track Products. Prepared for the California Waste Management Board, January, 2007.
- Pavilonis BT, Weisel CP, Buckley B, Lioy PJ. 2014. Bio accessibility and Risk of Exposure to Metals and SVOCs in Artificial Turf Field Fill Materials and Fibers. Risk Anal. 34: 44-55.

C Suzanne Blancaflor, M.S., M.P.H., Chief
Environmental Health Section
Ellen Blaschinski, R.S., M.B.A., Chief
Regulatory Services Branch