

Memorandum *DRAFT

To: City Council Health Environment Community Engagement Committee

From: PHAC/CEAC

Date: December 5, 2016

Subject: Recycled tires as ground cover Recommendations

This memo is in response to City Council Health Environment and Community Engagement June 20, 2016 direction:

- Requesting that the Public Health Advisory Committee (PHAC) and the Community Environmental Advisory Commission (CEAC) study and make recommendations regarding the use of waste tires as ground cover in Minneapolis and report back to the Health, Environment and Community Engagement Committee in February of 2017.
- Directing staff from the Health Department and City Coordinator's Office of Sustainability to work with the Public Health Advisory Committee and the Community Environmental Advisory Commission to support their efforts to study and make recommendations regarding the use of waste tires as ground cover in Minneapolis

Appreciation of the Problem

Outdoor playgrounds, sports and athletic fields are critical assets to promote physical activity. The choice of surface materials can affect the safety, usability, and cost of maintaining the play area. Additional factors to consider when making decisions about surfacing materials include: length of season, concentration of use, increasing play time, durability, minimum required depths, fall height, initial installation and ongoing costs, maintenance, and replacement. It is important to note that all surfacing materials have benefits and challenges when taking into account the multiple factors for determining the best product for use in particular situations.

Awareness of crumb rubber and rubber tire mulch as a potential health and environmental issue was brought to the forefront by parental concern for the health of their children.

The Minneapolis Public Schools (MPS) and the Minneapolis Park and Recreation Board (MPRB) put safety of Minneapolis children at the top of their priorities when considering playground and park / field development, usability, cost, and maintenance. Each follows guidelines set forth by the U.S. Consumer Product Safety Commission.

Sports and athletic fields most often consist of natural turf or artificial turf, which may include some type of infill material.

Options available for surfacing around children's play areas and under playground equipment include loose fill materials and unitary surfacing materials.

- 1) Examples of loose fill materials: organic infill composed of coconut fiber, cork and rice husk blend; wood products such as engineered wood fiber, pea gravel, sand, shredded/recycled rubber mulch, wood mulch (not CCA treated*) and traditional wood chips. *CCA = chromated copper arsenate

- 2) Examples of unitary surfacing materials include: “poured-in-place” rubber surfacing or any combination of energy-absorbing materials held in place by a binding agent and cured to create a unitary shock absorbing surface.

Product Definitions

Crumb rubber is granulated rubber made from recycled tires to form small, uniform pellets. Tires are broken up by grinding or freezing; steel and other fibers are almost entirely removed in the manufacturing process. One common use for crumb rubber is as filler in synthetic turf fields.

Tire mulch is shredded rubber made from recycled tires and is similar in size to traditional wood chips. One common use for tire mulch is as surface covering around children’s play areas and under playground equipment.

Organic infill is composed of plant-derived materials, often made of coconut fiber, cork and rice husk blend that is recyclable, organic, claims to be chemical free, and may require more frequent maintenance (to be “topped off”) as the infill decomposes.

Engineered wood fiber (EWF) made from 100% virgin wood fiber which is not chemically treated. EWF products are designed specifically for use as a playground safety surface.

Grass and dirt are not considered protective surfacing especially in playground construction because wear and environmental factors reduce their shock absorbing effectiveness. Athletic / sports fields using dirt and grass have additional challenges with regard to weather, durability, and maintenance.

Wood mulch (not CCA-treated*) and wood chips compress at least 25% over time due to use and weathering, require greater depth for safety, frequent maintenance to ensure surface levels never drop below the minimum depth, and are subject to standing water and freezing in winter. *CCA = chromated copper arsenate

Pea gravel and sand do not provide suitable fall protection when considering fall height. These products are more typically used in sand boxes, activity walls at ground level, around play houses, or any other equipment children use at ground level.

Unitary surfacing materials such as “poured in place” rubber surfacing consists of rubber mats and tiles or combination of energy-absorbing materials held in place by a binder that may be pour in place at the playground site and then cured to form a unitary shock absorbing surface. Unitary materials are available from a number of different manufacturers, many of whom have a range of materials with differing shock absorbing properties.

PHAC and CEAC Recommendations from 2008

Both groups were asked to make recommendations in 2008 related to recycled tires; see attachments A and B.

Formation of Joint Recycled Tire Committee

The following members volunteered to form a Joint Recycled Tire Committee and report/update their respective organizations:

- **CEAC:** Anna Abruzzese (CEAC chair), Andrew Murray (CEAC vice chair), Jenna Grove (Clean Water Action), Meleah Houseknecht, and sitting in for Adam Arvidson, CEAC MPRB member – Jon Duesman, PLA - MPRB
- **PHAC:** Karen Soderberg, PHAC co-chair & Ward 7 rep; Joey Colianni, member at large; Craig Hedberg, University of Minnesota – School of Public Health; and sitting in for the PHAC MPS representative - Lee Setter, Manager - MPS Environmental Health & Safety

Related Meetings by Joint Recycled Tire Committee

- August 23, 2016: Presentation by Play It Safe Minnesota, a non-profit organization that is seeking a ban on recycled tires in playgrounds and fields. This group made a presentation to HECE in June, which resulted in City Council direction for the joint committee study and request to develop a set of recommendations.
- September 8, 2016: Presentations by Minneapolis Public Schools (MPS) and Minneapolis Park and Recreation Board (MPRB). Key points of each presentation are summarized below.
- October 25, 2016: Presentations by William Toscano, PhD, Professor-Environmental Health Sciences, University of Minnesota-School of Public Health (UMN-SPH); Matt Simcik, PhD, Associate Professor-Environmental Health Sciences, UMN-SPH; and Michael Peterson, M.E.M, DABT, Sr. Toxicologist with Gradient. Professor Toscano is a toxicologist who studies endocrine disruption; Professor Simcik is an environmental chemist who has advised several school districts on this issue; and, Mr. Peterson is an industry representative specializing in human health risk assessment.

To create an open process of sharing information, representatives of Minneapolis Public Schools, Minneapolis Park and Recreation Board, Play It Safe Minnesota, and Field Turf were invited to present to the joint sub-committee. Other interested guests were informed of and invited to the joint committee meetings as well. All meeting information including agendas, presentations, and meeting notes / minutes were posted on the Public Health Advisory Committee webpage.

Minneapolis Context

- **MPS** currently has 47 playground areas (of 66 total) with rubber mulch, eight (8) have engineered wood mulch, ten (10) playground areas (tot lots) use sand, one pour-in-place at new Dowling Adaptive playground, and one synthetic turf field with crumb rubber infill at Washburn High School.
 - Previous complaints about wood mulch concerned mold, safety, freezing, and drainage.
 - Rubber tire mulch used because at the time, it was promoted by the EPA and Consumer Product Safety Commission for safety, durability, and the product does not degrade.
 - MPS is temporarily on hold with the conversion of the last eight (8) engineered wood mulch playgrounds to engineered rubber mulch. This temporary hold allows time for government studies on the use of engineered rubber mulch and conclusive links to health hazards. They do not have any immediate plans to add more artificial turf fields at this time.
 - MPS is performing routine maintenance on existing engineered rubber mulch playgrounds.
 - See Attachment C for more detailed information. (Handout from September 8, 2016 meeting)
- **MPRB** uses artificial turf with crumb rubber infill in 8 locations. No crumb rubber or synthetic turf is used on playgrounds, rather MPRB playgrounds use pour-in-place combined with sand or engineered wood fiber.
 - Artificial turf with crumb rubber infill withstands the wear-and-tear of lengthy seasonal use and heavy demand.
 - MPRB has started allocating rehabilitation funds in its capital plan in 2019-2020 for older artificial turf fields.
 - See Attachment D for more detailed information. (Handout from September 8, 2016 meeting)
- **Both MPS and MPRB** rely on the U.S. Consumer Product Safety Commission's "Public Playground Safety Handbook" for guidance which identifies shredded/recycled rubber mulch as an "Appropriate Surfacing" product, given that this product can meet impact attenuation requirements of ASTM F1292, as long as minimum depths of the material are maintained as specified in Table 2 of Section 2.5 in the Handbook. This notation is "solely focused on the impact attenuation to minimize serious head injuries, and not on other aspects that may pose other risks, such as chemical exposure or ingestion." (See Attachment E, cover page plus pages 8-10).

- It is unknown how many playground areas and artificial fields are in the City from other sources such as places of worship, private schools, day care centers, etc.

Federal and State Activities

- **Federal:** On February 12, 2016 the U.S. Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (ATSDR), and the U.S. Consumer Product Safety Commission (CPSC) launched a multi-agency action plan to study key environmental human health questions. By late 2016, the agencies will release a draft status report that describes the findings and conclusions of the research through that point in time. The report will also outline any additional research needs and next steps. The full report will be released at a later date.
- **State of Minnesota:**
 - 1) The Minnesota Department of Health (MDH) put out fact sheet on crumb rubber in April 2016. Their fact sheet references two major studies that are currently underway: the EPA study referenced above and a study by the California Office of Health Hazard Assessment which will run through 2018. (See Attachment F)
 - MDH is tracking these studies and will consider their results in any future recommendations regarding the use of crumb rubber in synthetic turf fields.
 - 2) Hennepin County and Bloomington-Richfield-Edina public health departments are currently not studying the public health effects of crumb rubber – tire mulch.
 - In April 2016, the Edina school board approved conversion of four grass fields to artificial turf and a fifth synthetic field is being replaced with new crumb rubber.
 - On May 12, the Edina Energy and Environment Commission voted to condemn the use of crumb rubber in Edina.
 - 3) In June 2016, the Duluth School Board voted to move forward with plans to replace the rubber mulch used on most district elementary school playgrounds. The board voted unanimously on the measure with plans to have the rubber mulch removed by the start of the 2017-2018 schoolyear.
 - 4) During the 2015 legislative session, two bills were introduced: House File 3496 (HF3496) and Senate File 3108 (SF3108). The proposed legislation would have established a moratorium on the use of recycled tire mulch and crumb rubber on any new construction of public parks and school playgrounds until 2019. Public parks and school playgrounds already utilizing the material would have been required to post signs to educate users on ways to reduce exposure. House File 3496 was referred to the Committee on Government Operations and Elections Policy and given an informational hearing; Senate File 3108 was referred to the Committee on Environment and Energy and received no hearing.

Joint Committee Key Findings

- 1) Everyone wants to ensure the safety and well-being of our children and community.
- 2) The City does not operate any fields / parks but has political power, influence, and partnerships which could be leveraged.
- 3) The chemical composition of tire rubber is designed to enhance the functionality of tires on automobiles and trucks. Tire rubber contains a variety of chemicals that are known to be toxic; however, it remains to be determined whether the extent of exposure to these chemicals on play surfaces covered by recycled tire materials poses an actual health risk.
- 4) Concerns have been raised about possible toxic effects of recycled tires, including off-gas, ingestion, surface overheating, along with ground water, soil contamination.
- 5) Surface material selection and proper installation play a crucial role in creating safer playground areas and minimize injuries associated with playground equipment.

- 6) It is a difficult balance between competing concerns which include: increasing playtime outside (given Minnesota's shorter playing seasons), safety and injury management, cost of installation and ongoing maintenance, and field/playground durability.
- 7) Crumb rubber infill and / or rubber tire mulch in existing playgrounds and athletic fields is costly to replace. **(See Handouts C & D from MPS and MPRB)**
- 8) **MPS** has potential legal liability for playground fall injuries where protection does not meet standards.
- 9) **MDH** is tracking two important studies currently underway examining potential health effects from crumb rubber and synthetic turf. One is being led by the federal Environmental Protection Agency. The second is by the California Office of Health Hazard Assessment and will run through mid-2019. (See Attachment G)
 - a. **The EPA study** may not present findings that are dramatically different from what is currently known, but a draft report will not be available until late 2016.
 - b. **The California study** is including biological measures over time and may provide more information on long-term health effects, but is not due to be completed until mid-2019.

Recommendations: Based on the committees' learning and discussions, we recommend a moratorium on City financed projects-outside of Neighborhood Park Plan 2020 financing-regarding the use of crumb rubber-rubber tire mulch until 12/31/2019 (see #2 below) and that the City convene its partners and stakeholders in planning out thoughtful proactive approaches and contingency plans during the time of the moratorium (see #1 below).

- 1) Given the City's political power and influence, we recommend leveraging partnerships which have the same goals in mind, those of: safety, injury management, healthy active living, and outdoor recreation. Specifically, we recommend that:
 - a. Representatives from the City Council, MPS, MPRB and other stakeholders follow this issue closely and collaborate to plan out thoughtful proactive approaches and identify resources.
 - b. City Council support its partners' investment in finding alternatives by asking stakeholders to begin to develop contingency plans, timelines, and budgets for change from rubber mulch, crumb rubber to potentially less toxic options without sacrificing safety. The contingency plans may vary by partner depending on patterns of use, options for replacement, type of installation, and budgetary considerations.
 - c. The City Council actively support efforts by other agencies and partners operating in the City in their efforts to address community concerns, including advocacy and support for additional funding for alternative materials if warranted.
 - d. An inventory of all fields and playgrounds in the City including those located at places of worship, private schools, day care centers, etc. in Minneapolis. This inventory would provide scope and scale if future action is desired or required. The City should partner with existing organizations that are undertaking this work. The inventory should include location, approximate square footage, and estimated usage.
 - e. The City engage in raising awareness with users and property owners of the use of crumb rubber infill and recycled tire mulch about the simple precautions that can be taken as recommended by Minnesota Department of Health. (See Attachment F, page 2)

- 2) Given that two significant studies from the EPA and the California Office of Environmental Health Hazard are underway and that MDH is awaiting results of these studies before moving forward with recommendations / guidelines, we recommend a moratorium on the use of city funding, in the form of grants or direct appropriations to city- or community-led projects, for all new development of fields / playgrounds using crumb rubber infill or for fields / playgrounds converting current wood fiber to rubber mulch. This moratorium would not apply to the city's fund transfer to MPRB under the NPP20 agreement.
 - a. A moratorium would be dated to end 12/31/2019. A time-dated moratorium provides the City and its partners / stakeholders opportunities to engage in dialogue, collaboration, and problem-solving given that planning processes take several years. Special considerations related to this moratorium include:

- i. Rubber mulch used in playgrounds and crumb rubber infill currently in use would need to be maintained to the proper safety depth.
 - ii. It is costly to replace crumb rubber infill and / or rubber tire mulch in existing playgrounds and athletic fields (See Attachments C and D). City-partner-stakeholder conversations need to include a mechanism for addressing timing and cost.
 - iii. MPRB has plans in 2019 to expand the existing synthetic field at Currie Park (which currently includes crumb rubber) from a single youth-sized field to a double youth-sized synthetic (premier) surface. This project has high community engagement and a delay is expected to be unwelcome. MPRB and the City should collaborate to ensure that alternative options to crumb rubber can be considered within the project budget and timeframe (see recommendation 1c).
- b. A moratorium provides time for the City to convene a partner / stakeholder group to discuss collaborative efforts on what to do, for the development of contingency plans, and to complete an inventory of all fields impacted by potential future decisions / actions.
 - c. A moratorium provides opportunities to educate users and property owners on crumb rubber infill and recycled tire mulch about the simple precautions that can be taken.
 - d. A moratorium provides opportunities to engage residents in this discussion related to fields and playgrounds in their neighborhoods.

In order to help support these recommendations, PHAC and CEAC will continue to monitor the issue and may be called on to provide insight and perspectives throughout the time period of the moratorium and after more substantial scientific studies have been completed.

EPA and California Studies

EPA

- Led and chiefly implemented by the US Environmental Protection Agency (EPA) and the Centers for Disease Control and Prevention's National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (CDC-NCEH/ATSDR), in cooperation with the US Consumer Product Safety Commission (CPSC) and other agencies. Other agencies such as National Institute of Environmental Health Sciences, the U.S. Department of Defense and California's Office of Environmental Health Hazard Assessment will provide expertise, facilities and/or sharing of information.
- Research is currently underway and the plan is to release a status report with the summary of findings by the end of 2016. While this effort won't provide all the answers, the information will help answer some of the key questions that have been raised about tire crumb used in artificial turf fields and will provide a better understanding of potential exposures that people may experience by using these fields.
- Tire crumb sample collection and field sampling is underway. Tire crumb samples will be collected from up to 40 different locations within the four US census regions. These locations include both outdoor and indoor playing fields as well as recycled tire crumb manufacturing plants. To protect privacy, the names of the specific locations sampled will not be released publicly.
- By the end of 2016, the agencies anticipate releasing a draft status report that describes the preliminary findings and conclusions of the research through that point in time. The draft status report will summarize the agencies' progress in: (1) Identifying key constituents of concern in recycled tire crumb used in artificial turf fields; (2) Assessing potential exposures to potentially harmful constituents; (3) Conducting an initial evaluation of potential cancer and non-cancer toxicity of key chemical constituents; and (4) Identifying follow-up activities that could be conducted to provide additional insights about potential risks. The results of the preliminary work on recycled tire-derived playground surface materials will also be described. The report will also outline any additional research needs and next steps.

California Office of Environmental Health Hazard Assessment

- A comprehensive study which will include a review of current knowledge, public input, exposure assessment, and estimated health outcomes, scheduled for completion in mid-2019. A draft report describing the preliminary data and results of the study will be released in mid-2018.
- The study is assessing the potential health impacts associated with playing on synthetic turf fields and playground mats. It is examining athletic fields and playground mats made from crumb rubber derived from recycled tires. Major parts of the study include:
 1. Identifying and measuring chemicals released from crumb rubber and artificial grass blades in indoor and outdoor fields and playground mats throughout California.
 2. Evaluating exposures to chemicals released from crumb rubber and synthetic grass blades through inhalation, swallowing, and skin contact.
 3. Evaluating the hazards and toxicological activities of chemicals released from turf. This includes examining the ways that sensitive populations, such as children, may be more vulnerable to chemicals released from synthetic turf fields.
 4. Developing a study protocol for measuring chemicals from synthetic turf in urine or other bodily fluids of athletes, or using personal monitors worn by athletes.
 5. Conducting an assessment of potential health impacts associated with exposures to chemicals released from synthetic turf and playground mats, taking into account the finding of the above activities.