



SYNTHETIC TURF

Fullerton Joint Union High School District
Board Meeting – July 12, 2016



Why Synthetic?

- Safety
- Playability--24/7/365
- Consistency
- Maintenance/Value
- Water Conservation



Concern About Recycled Rubber



School Districts that have artificial turf fields

- ▶ Approximately 300 fields are in California
- ▶ 200 fields are located in Southern California



Palos Verdes Unified
Lake Elsinore Unified
Riverside Unified
Santa Monica Unified
Alvord Unified
Newport Mesa Unified
Pomona Unified
Downey Unified
Baldwin Park Unified
Duarte Unified
Paramount Unified

ValVerde Unified
Santa Ana Unified
Capistrano Unified
Saddleback Unified
Monrovia Unified
Laguna Hills Unified
Laguna Beach Unified
Irvine Unified
Fontana Unified
Walnut Unified
Covina Unified

San Diego Unified
Tustin Unified
Norwalk Unified
Long Beach Unified
Pasadena Unified



California Office of Environmental Health Hazard Assessment (OEHHA)

2007 Study
2010 Study

<http://www.oehha.ca.gov/risk.html>

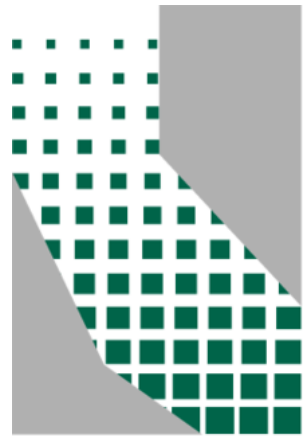


Contractor's Report to the Board

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

Produced under contract by:

January 2007



INTEGRATED
WASTE
MANAGEMENT
BOARD

OEHHA
Office of Environmental Health Hazard Assessment

Acknowledgments

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Executive Summary

Evaluation of toxicity due to ingestion of tire shreds based on the existing literature OEHHA found 46 studies in the scientific literature that measured the release of chemicals by recycled tires in laboratory settings and in field studies where recycled tires were used in civil engineering applications: 49 chemicals were identified. Using the highest published levels of chemicals released by recycled tires, the likelihood for noncancer health effects was calculated for a one-time ingestion of ten grams of tire shreds by a typical three-year-old child; only exposure to zinc exceeded its health-based screening value (i.e., value promulgated by a regulatory agency such as OEHHA or U.S. EPA). Overall, we consider it unlikely that a onetime ingestion of tire shreds would produce adverse health effects. Seven of the chemicals leaching from tire shreds in published studies were carcinogens, yielding a 1.2×10^{-7} (1.2 in ten million) increased cancer risk for the one-time ingestion described above. This risk is well below the di minimis level of 1×10^{-6} (one in one million), generally considered an acceptable cancer risk due to its small magnitude compared to the overall cancer rate (OEHHA, 2006).

Safety Study of Artificial Turf Containing Crumb Rubber Infill Made From Recycled Tires: Measurements of Chemicals and Particulates in the Air, Bacteria in the Turf, and Skin Abrasions Caused by Contact with the Surface

October 2010

Contractor's Report Produced Under Contract By: Office of
Environmental Health Hazard Assessment Pesticide and Environmental
Toxicology Branch



California Department of Resources Recycling and Recovery

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We also thank the athletic trainers from colleges and universities in California and Nevada for collecting and reporting the skin abrasion data. Similarly, we thank the coaches in the California Youth Soccer Association (CYSA, northern division) for reporting the data on soccer playing time. Lastly, we acknowledge and thank the managers of the schools and municipalities in California who granted us access to their artificial and natural turf fields so that we could perform this study.

Executive Summary

Study Goals

Determine whether the new generation of artificial turf athletic field containing recycled crumb rubber infill is a public health hazard with regard to:

- 1. **Skin infection:** Do these fields increase the risk of serious skin infections in athletes, either by harboring more bacteria or by causing more skin abrasions (also known as turf burns) than natural turf?
- 2. **Inhalation:** Do these fields release significant amounts of volatile organic compounds (VOCs) or fine particulates of aerodynamic diameter less than 2.5 microns (PM2.5 and associated metals) into the air? If so, are the levels harmful to the health of persons using these fields?

Methods

- 1. Inhalation hazard
 - a. Measure PM2.5 and bound metals in air sampled from above artificial turf fields during periods of active field use. Compare to concentrations in the air sampled upwind of each field.
 - b. Measure VOCs in the air sampled from above artificial turf fields during hot summer days. Compare to concentrations in the air sampled from above nearby natural turf fields.
- 2. Skin infection hazard
 - a. Measure bacteria on components (infill/soil and blades) of existing artificial and natural turf fields.
 - b. With the cooperation of athletic trainers from colleges and universities in California and Nevada, measure skin abrasion rates for varsity soccer players competing on artificial and natural turf fields.

Results and Conclusions

- 1. Inhalation hazard

- a. PM_{2.5} and associated elements (including lead and other heavy metals) were either below the level of detection or at similar concentrations above artificial turf athletic fields and upwind of the fields. No public health concern was identified.
- b. The large majority of air samples collected from above artificial turf had VOC concentrations that were below the limit of detection. Those VOCs that were detected were usually present in only one or two samples out of the eight samples collected per field. There was also little consistency among the four artificial turf fields with regards to the VOCs detected. Nevertheless, seven VOCs detected above artificial turf were evaluated in a screening-level estimate of health risks for both chronic and acute inhalation exposure scenarios. All exposures were below health-based screening levels, suggesting that adverse health effects were unlikely to occur in persons using artificial turf.
- c. There was no correlation between the concentrations or types of VOCs detected above artificial turf and the surface temperature

- 2. Skin infection hazard

- a. Fewer bacteria were detected on artificial turf compared to natural turf. This was true for MRSA and other Staphylococci capable of infecting humans. This would tend to decrease the risk of skin infection in athletes using artificial turf relative to athletes using natural turf.
- b. The rate of skin abrasions due to contact with the turf was two- to three-fold higher for college soccer players competing on artificial turf compared to natural turf. This was observed for both female and male teams. Skin abrasion seriousness was similar on the two surfaces. The higher skin abrasion rate would tend to increase the risk of skin infection in athletes using artificial turf relative to athletes using natural turf.
- c. The sum of these effects on the skin infection rate for artificial turf relative to natural turf cannot be predicted from these data alone. Measuring the skin infection rates in athletes competing on artificial and natural turf might determine if there is a significant difference.

OEHHA

- Currently on 3rd Review 2016

Water Conservation

by

Mike Grisso, Utilites Manager
City of Buena Park Water Department

California Drought Update

- ▶ Kicking off fifth consecutive year of extreme dry conditions in Southern CA
- ▶ El Nino brought average rain and snow fall (predominately to Northern CA)
- ▶ Executive Order B-37-16 “Making Water Conservation a California Way of Life”
 - ▶ Continues Governor Brown’s Emergency Drought Regulations through January 2017
 - ▶ Creates more permanent statewide water use restrictions
- ▶ Buena Park to remain in Water Conservation Ordinance
 - ▶ Limited outdoor irrigation
 - ▶ No excessive use or run-off from property
 - ▶ Obligation to repair leaks

Potential Water Savings

- ▶ Buena Park High School does not individually meter for irrigation water
 - ▶ One master meter provides water for entire campus
- ▶ 2-acre turf athletic field (87,120 sq. ft.)
- ▶ In Orange County, turf typically requires 48-inches of water per year to remain healthy. Assuming average rainfall of 12 inches annually, potable irrigation water is needed to provide the remaining 36 inches (3 feet).
- ▶ Replacing the 2-acre athletic field at BPHS will conserve approximately 1.95 million gallons
- ▶ Essentially each acre of turf replaced, saves one million gallons of drinking water

Need for Water Canons/Sprinklers

- Use
 - Cleans field
 - Cools field
- Gallons Per Year
 - 1 minute on hot days
 - Approximately 1000 gallons a year

Safety Sonora High School

presented by Adam Bailey



Epidemiological Research

- ▶ Questions:
 - ▶ Is there a difference in injury risk between playing on synthetic turf and natural turf?
 - ▶ Are there different types of injuries on synthetic turf?



Epidemiological Research

- ▶ Very few studies - WHY?
 - ▶ Separate contributors to injuries
 - Contact vs. non-contact
 - Shoe type
 - Weather conditions
 - Who records the data
 - Statistics - large sample size is needed



Injury Data

- ▶ NCAA Injury Surveillance System
 - ▶ Over 25 years of injury data
- ▶ High School RIO
 - ▶ Internet based reporting system
- ▶ NFL Injury Surveillance System



Injury Studies

- ▶ 11 scientific injury studies published - infilled synthetic turf vs. natural grass (peer-reviewed)
 - ▶ Soccer - 8 studies
 - ▶ Europe
 - ▶ Professional and youth players
 - ▶ Boys and Girls
 - ▶ Game vs. Practice
 - ▶ Football - 2 studies
 - ▶ High School
 - ▶ College
 - ▶ Rugby - 1 study

Injury Studies - Findings

- ▶ No study found higher overall injury rate on synthetic turf
 - ▶ 1 football study - lower overall injury rate on synthetic turf
- ▶ Statistical trends
 - ▶ Ankle injuries - some types are more common and there are others that are less common on synthetic turf

High School Football Study

- ▶ Synthetic turf - higher incidence of...
 - ▶ Zero-day time loss injuries
 - ▶ Non-contact injuries
 - ▶ Surface/epidermal injuries
 - ▶ Muscle-related trauma
 - ▶ Injuries during high temperatures
- ▶ Natural grass - higher incidence of...
 - ▶ 1-2 day time loss injuries
 - ▶ 22+ day injuries
 - ▶ Head and neural trauma
 - ▶ Ligament injuries
 - ▶ *most of injuries on dry fields

Concussions

- ▶ 10 - 20% of concussions from impact with the surface
- ▶ High School study - higher concussion rate on natural grass
 - ▶ Dry field conditions



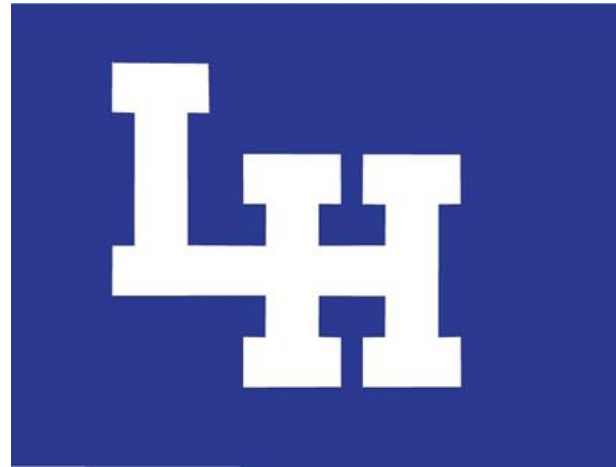
Injury Risk Conclusion

- ▶ No difference in overall injury risk between infilled synthetic turf and natural grass



Playability Use La Habra High School

Presented by Karl Zener



Stadium Usage

- ▶ Football--2 schools, 6 levels (200+ students)
- ▶ Boys and Girls Soccer--4 levels (100+ students)
- ▶ Band/color guard (200+ students)
- ▶ NJROTC (170+ students)
- ▶ Currently use grass field stadium 145 days a year.
- ▶ With turf, would use stadium 365 days a year.

- ▶ Currently, stadium is closed for spring and summer to rejuvenate grass. There are limited football passing league games and practices during spring in summer. In fall, stadium is used Thursdays and Fridays for games. It is used sparingly during the week for football practice. In the winter, it is used for games Tuesday, Wednesday, Thursday, and Fridays.

- ▶ With artificial turf, it would be used every afternoon and evening, Monday-Saturday. by LHHS and SOHS for football, soccer, band, NJROTC, color guard practice and competitions. It would be used by outside groups (youth soccer and pop warner football) when available and on Sundays.

- ▶ Football plays its non-league and playoff away games on artificial turf. All local schools (La Mirada, La Serna, Cal High) play on turf. When we have premiere home game (CIF finals) we must rent a larger facility (Cerritos College) which is turf. We only play on grass at home and league games.









Slipping and sliding on real turf... Wet muddy fields are a hazard



Consistency Troy High School

Presented by Will Mynster



Consistency

Field is usable in all seasons.

Properly drained, field is usable in all weather conditions.

Turf at each campus provides consistency in terms of preparation for all athletic teams that compete on turf against both preseason and league opponents.

Field provides a surface that is true and predictable for all athletes and sports. This is especially true for soccer as the ball rolls across the surface.

A consistent field also improves the quality of play, as athletes can be certain they will not be stepping into an unseen hole or rut in the field.



Return on Investment

Cost to Install New Turf Field

Natural Turf

\$480,000

Synthetic Turf

\$960,000

Difference

\$480,000

Maintenance Costs Per Year

Maintenance Hours and Materials	Natural Turf	Synthetic Turf
Mowing	\$15,000	\$0
Fertilizer	\$2,120	\$0
Aerify	\$1,440	\$0
Top Dressing	\$2,440	\$0
Sand Fill	\$910	\$500
Insecticide	\$1,030	\$0
Over-Seeding	\$2,440	\$0
Field Painting	\$1,380	\$0
Irrigation Repair	\$11,360	\$1,000
Water	\$5,600	\$500
Turf Repair	\$0	\$1,000
TOTAL (without escalation)	\$43,720	\$3,000

Return on Investment

Maintenance Costs Per Year

\$40,720

Cost Difference-New to Artificial

\$480,000

Return on Investment = 11.78 Years

Cost Over 12 Years

Natural Turf

Complete replacement of turf (3 times)	\$300,000
Maintenance	\$525,360
Total 12 Years Maintenance	\$825,360
Savings	

Synthetic Turf

\$480,000	(1 time)
\$36,000	
\$516,000	
\$309,360	

Questions and Answers

