

[US EPA](#)

United States Environmental Protection Agency

Tire Crumb Questions and Answers

Q. Which agencies are involved with the Federal Research Action Plan?

This plan is 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 (OEHHA) will provide expertise, facilities and/or sharing of information.

Q. What research is included in the Federal Research Action Plan? Will it answer the question of whether tire crumb is safe?

The plan includes four research activities:

1. **Outreach to key stakeholders** - EPA, CDC/ATSDR, and CPSC are having discussions with other government agencies that have researched or are currently researching tire crumb that provide expertise to inform the federal study, and other key stakeholder groups including tire crumb manufacturers, non-profit organizations, field installers and maintenance professionals, and field users.
2. **Analysis of data gaps** - EPA, CDC/ATSDR, and CPSC evaluated the existing scientific information related to the use of recycled rubber tire crumb in synthetic turf fields to understand the current state-of-the-science and inform the research activities. The Literature Review and Data Gaps Analysis is included in the status report released in December 2016.
3. **Characterization of the chemicals found in tire crumb** - EPA, CDC/ATSDR, and CPSC are testing tire crumb from different manufacturing plants and fields. These tests, along with existing scientific information from the literature, will help us better understand the make-up of tire crumb.
4. **Characterization of the exposure scenarios** - EPA, CDC/ATSDR, and CPSC are conducting several activities to better understand potential exposures that may occur when people use synthetic turf fields. This work is considering all possible ways that one may be exposed including by breathing, unintentionally ingesting, or touching tire crumb or the chemicals in tire crumb.

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 synthetic turf fields and will provide a better understanding of potential exposures that field users may experience by using these fields. The research activities have been prioritized based on data needs and available resources. This study will provide a better understanding of the chemicals found in tire crumb and the potential

exposures that field users may experience by using these fields. This study, in and of itself, will not determine if fields are safe, but this work is a necessary first step that needs to be taken.

Depending on the findings, available resources and other considerations, additional research beyond the first year may be conducted.

Q. What is the status of the research?

On December 30, 2016, the agencies released a status report describing the progress of the research to date. The status report includes the final peer-reviewed Literature Review/Gaps Analysis report and describes the progress to date on other research activities that are part of the effort including:

- Characterization of the chemicals found in tire crumb.
- Characterization of the exposure scenarios for those who use turf fields containing tire crumb.
- Study to better understand how children use playgrounds containing tire crumb.
- Outreach to key stakeholders.

A final peer-reviewed Literature Review/Gaps Analysis was publicly released in December 2016 as part of the status report. The status report does not include research findings.

Collection of tire crumb samples from fields and recycling facilities is complete. Tire crumb samples were gathered from nine tire crumb manufacturing plants, 19 fields located on U.S. Army installations and 21 community fields across the U.S. Fields included both outdoor and indoor fields. Analysis of the tire crumb samples collected from fields and recycling facilities, and the exposure characterization component of the study, will continue in 2017. Parts of the exposure study may be conducted during the hotter months of 2017. The CPSC playground study will continue in 2017.

The Synthetic Turf Fields with Tire Crumb Rubber Infill Research Protocol document was extensively reviewed, including a peer-review and an Institutional Review Board review, and the document is now final. Data collection components of the Federal Research on Recycled Tire Crumbs went through a public comment period and an [Information Collection Request](#) review conducted by the Office of Management and Budget. Peer-review and public comments are publicly available on the [OMB's website](#). One of the main research activities gathered tire crumb samples from tire crumb manufacturing plants and from fields across the country.

EPA, ATSDR, and CPSC have engaged various stakeholder groups through a number of outreach activities including a public comment process, webinars, conference calls, and in-person meetings. Stakeholder outreach efforts were targeted to the public as well as specific stakeholder groups, such as government organizations (other federal agencies, state agencies, local government and international government), industry and non-profit/interest groups.

As it is available, updated information will be posted to EPA's tire crumb website (www.epa.gov/tirecrumb).

Q. When did the research begin and when will it end?

The Federal Research Action Plan launched on February 12, 2016. The data collection components (tire crumb sample collection and exposure characterization) of the study received OMB approval in August 2016. EPA, ATSDR, and CPSC engaged various stakeholder groups through a number of outreach activities including a public comment process, webinars, conference calls, and in-person meetings. The final peer reviewed *Literature Review/Gaps Analysis* report along with a progress report for other components of the study was released in December 2016. Analysis of the tire crumb samples collected from fields and recycling facilities, and the exposure characterization component of the study, will continue in 2017. Parts of the exposure study may be conducted during the hotter months of 2017. The CPSC playground study also will continue in 2017.

Q. Where can I find responses to the public comments on this research submitted through the Federal Register Notice?

Public comments submitted in response to the Federal Register Notice have been reviewed by EPA and CDC/ATSDR. EPA and CDC/ATSDR responses to public comments are available online - http://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201607-0923-001 .

Q. What is the research protocol document?

The research protocol document describes the study design and protocol for three research activities in the Federal Research Action Plan including the literature review and data gaps analysis; the tire crumb collection and characterization; and the characterization of human exposure to tire crumb in synthetic turf fields. The document explains the study objectives, research design, methods that are being used to characterize tire crumb and the exposures, data analysis techniques and the quality assurance/quality control measures in place to ensure the integrity of the research.

Q: Where are the fields located that will be studied?

Tire crumb samples were gathered from nine tire crumb manufacturing plants, 19 fields located on U.S. Army installations and 21 community fields across the U.S. Fields included both outdoor and indoor fields. The analysis of the tire crumb samples is underway. These locations include both outdoor and indoor playing fields. To protect privacy, the names of the specific locations sampled will not be released to the public.

Q. How can I find out more information about this research?

As it is available, updated information about the study will be posted to EPA's Tire Crumb Website: www.epa.gov/tirecrumb.

Q. What stakeholder outreach activities have been completed as part of this study?

EPA, ATSDR, and CPSC have engaged various stakeholder groups through a number of outreach activities including a public comment period, webinars, conference calls, and in-person meetings. Stakeholder outreach efforts were targeted to the public as well as specific stakeholder groups such as government organizations (other federal agencies, state agencies, local government and international government), industry and non-profit/interest groups.

The purpose of the stakeholder outreach was to inform the public about the *Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields and Playgrounds* and to encourage stakeholders to provide feedback on studies that are part of the research. The outreach to specific stakeholder groups also included information sharing around the manufacturing and the use of tire crumb in synthetic turf fields.

Q. What are the key findings of the Literature Review/Gaps Analysis?

An important component of any research is to understand the state of the science and any data gaps. The peer-reviewed Literature Review/Gaps Analysis (LRGA) provides a current summary of the available literature and capture the data gaps as characterized in those publications. The overall goals of the LRGA were to inform the interagency research study and to identify potential areas for future research that might be needed. The LRGA identified 90 references. Each reference reviewed was categorized according to 20 general information categories (e.g., study topic, geographic location, sample type, conditions, and populations studied) and more than 100 sub-categories (e.g., study topic subcategories: site characterization, production process, leaching, off-gassing, microbial analysis, and human risk). The research in the Federal Research Action Plan addresses many of the gaps identified, particularly with respect to tire crumb rubber characterization and exposure characterization. The review provides information useful for guiding and designing future research efforts needed to further address questions regarding exposures and risks for tire crumb rubber used in synthetic turf fields and playgrounds.

Q. How is the Federal Government working with California?

California's Office of Environmental Health Hazard Assessment (OEHHA), under contract from CalRecycle, is conducting a comprehensive evaluation of tire crumb. This evaluation is being designed to deliver the kind of information states, communities and parents are looking for so they can make informed decisions for their communities and their families. The US National Toxicology Program, at the request of California's Office of Environmental Health Hazard Assessment, initiated a research program to better understand potential health impacts of chemicals released from synthetic turf with an emphasis on crumb rubber. More information about the NTP research is online at <http://ntp.niehs.nih.gov/results/areas/syntheticurf/research.html>. EPA, CPSC and other federal agencies are also working with California's OEHHA to provide expertise to assist with OEHHA's evaluation of tire crumb. More information about California's study is online - <http://oehha.ca.gov/risk-assessment/synthetic-turf-studies>.

Q. How is the US Federal Government working with other international government organizations interested in this topic, including the European Chemicals Agency?

The European Chemicals Agency (ECHA) contacted EPA expressing their interest in the U.S. study. ECHA is an agency of the European Union that implements chemical legislation for the protection of human health and the environment. This interest has resulted in regular calls with ECHA and an in-person meeting. During these meetings, information related to research efforts are shared. In addition, the Netherlands and France are also interested in studying tire crumb rubber exposure and characterization and communications with these organizations are on-going. More information about ECHA's study is online - <https://echa.europa.eu/addressing-chemicals-of-concern/restriction/calls-for-comments-and-evidence/-/substance-rev/15331/term>.

Q. What advice do you have for communities who are concerned about the use of tire crumb in fields?

We recognize that communities, parents and state and local officials are concerned about tire crumb used in synthetic turf fields. While this short-term study won't provide all the answers, the study's findings will provide a better understanding of the chemical composition of tire crumb and the potential exposures people may experience by using these fields.

Communities, parents, state and local officials are encouraged to explore the federal agencies' websites (CPSC - <https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center> and EPA - www.epa.gov/tirecrumb) to review the research results available to-date on the use of recycled tire rubber in playgrounds and synthetic turf fields. In addition, concerned individuals can check their state's public health agency websites to determine if there are state-specific recommendations. EPA compiled a list of information from state government websites, which can be found online - www.epa.gov/tirecrumb.

Q. Are there any alternative materials/products that can be used?

EPA is aware of a few alternatives to tire crumb that can be used as infill in synthetic turf, such as organic materials like sand, coconut husks, or cork. In addition, CPSC has suggested that the public and homeowners may use shredded mulch, and other materials to create a shock-absorbing surface under backyard and public playgrounds. However, EPA has not independently studied or evaluated any of these alternative materials.

Q. Who regulates the management and disposal of used tires?

State solid waste agencies are primarily responsible for regulating the management of used tires at their end of life, including options for recycling and disposal. You can consult your state solid waste regulatory agency for information and guidance on the proper management of used tires in a particular state.

Q. How is tire crumb produced?

Tire crumb is manufactured by reducing scrap tires down to various sizes depending on its intended application and market use, and by removing 99 percent or more of the steel and fabric from them. The tire crumb is classified by sifting screens that return oversize pieces back into the reduction process. Magnets are used throughout the process to remove the wire and other metal contaminants and air separators are used to remove the fabric. The American Society for Testing Materials (ASTM) has a standard test method (ASTM D5644) for determining the particle size distribution of recycled vulcanized particulate rubber (a.k.a. tire crumb). ASTM D5603 classifies recycled vulcanized particulate rubber based on particle size distribution and origin of the rubber.

Q. States and other organizations have conducted studies on tire crumb. What have they concluded?

Current information from a number of studies does not show an elevated health risk from playing on fields with tire crumb. However, these studies do not comprehensively address the concerns about the potential health risks associated with exposure to tire crumb.

Q. Will the results of the federal research be made public? Will states be given access to help them make decisions about use?

Analysis of the tire crumb samples collected from fields and recycling facilities, and the exposure characterization component of the study will continue in 2017. Parts of the exposure study may be conducted during the hotter months of 2017. The CPSC playground study also will continue in 2017. The agencies will release to the public a final peer-reviewed report describing the findings and conclusions of the studies.

Q. What are the various markets for tire crumb?

In the U.S., markets for tire crumb include new rubber products, playground and other sports surfacing, and rubber-modified asphalt. The tire crumb used in these ground rubber applications consumed 1,020,000 tons of scrap tires in 2015, or about 26% of the volume of scrap tires generated. Sports surfaces accounted for 25% of tire crumb use.

Ground Rubber Markets	
Molded/Extruded Rubber Products (e.g. rubber gaskets)	35%
Playground Mulch	22%
Sports Surfaces	25%
Asphalt	15%
Automotive	2%
Export	1%

Source: Rubber Manufacturers Association: 2015 U.S. Scrap Tire Management Summary.

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