



# ECOLOGYCENTER

Healthy People, Healthy Planet

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**Report on lead in pour in place (PIP) rubber playground at  
Janney Elementary School, 4130 Albemarle St. NW, Washington, DC**

The Ecology Center, a Michigan-based non-profit environmental organization, was contacted by the Safe Healthy Playing Fields in February 2019 regarding concerns about metals and other chemicals of concern that may be in rubber shred-based, PIP playgrounds and athletic fields. Safe Healthy Playing Fields provided a 43.5 gram grab sample of coarse rubber shred from a playground at Janney Elementary School, 4130 Albemarle St. NW, Washington, DC. Most of the shred particles ranged in size between approximately 0.25 – 1.5 centimeters. The rubber shred sampled as part of this study was only collected from the Janney School.

The rubber shred was analyzed by the Ecology Center using High Definition X-ray Fluorescence (HD XRF) manufactured by XOS (<https://www.xos.com/HDXRF>). The instrument used monochromatic excitation energies of 7, 17, and 33 KeV. The spot size is one millimeter. Our test method uses Certified Reference Materials ERM-EC680k and ERM-EC681k as reference standards ([http://publications.jrc.ec.europa.eu/repository/bitstream/JRC37540/7540%20-%20ERM-EC680k%20%20ERM-EC681k\\_report\\_complete.pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC37540/7540%20-%20ERM-EC680k%20%20ERM-EC681k_report_complete.pdf)).

Two samples with high HD XRF lead results were sent to a third-party lab, TUV Rheinland of North America, Inc., in April, 2019. The lab measured total lead in accordance with the US Consumer Product Safety Commission testing procedures for lead in children's products, CPSC-CH-E1002-08.3 Standard Operating Procedure for Determining Total Lead (Pb) in Nonmetal Children's Products, Revision November 15, 2012 ([https://www.cpsc.gov/s3fs-public/pdfs/blk\\_pdf\\_CPSC-CH-E1002-08\\_3.pdf](https://www.cpsc.gov/s3fs-public/pdfs/blk_pdf_CPSC-CH-E1002-08_3.pdf)). *The testing report from TUV is attached.*

## Lead Testing Results

The Ecology Center analyzed by HD XRF 34 individual rubber shreds in the 43.5 gram bulk sample. These 34 shreds represented approximately 50% by mass of the bulk sample. The lead content in the individual shred samples was heterogeneously distributed. The results can be grouped in to two categories: Non-detect to low; and high.

- **Non-detect to Low:** 26 of 34 (76%) of the rubber shred samples had lead levels less than 30.2 parts per million (ppm). Average concentration of lead in these samples was 4 ppm.
- **High:** 8 of 34 (24%) of the rubber shred samples had lead levels greater than 1,951 ppm. Detected levels of lead ranged from 1,951-59,096 ppm, with an average of 9,119 ppm. One sample was an outlier at 59,096 ppm. Removing that sample results in an average of 2,872 ppm.
- **All samples:** The average lead for all 34 samples was 2,417 ppm.

Due to the small spot size of HD XRF, only a 1-mm spot of each shred was analyzed by HD XRF. To analyze an entire shred, a third-party lab was contracted to dissolve the shred and measure the lead contained therein by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS). This method is expected to yield different lead levels compared to HD XRF when the lead is heterogeneously distributed. Two samples from the "high" group were submitted for ICP-MS analysis.

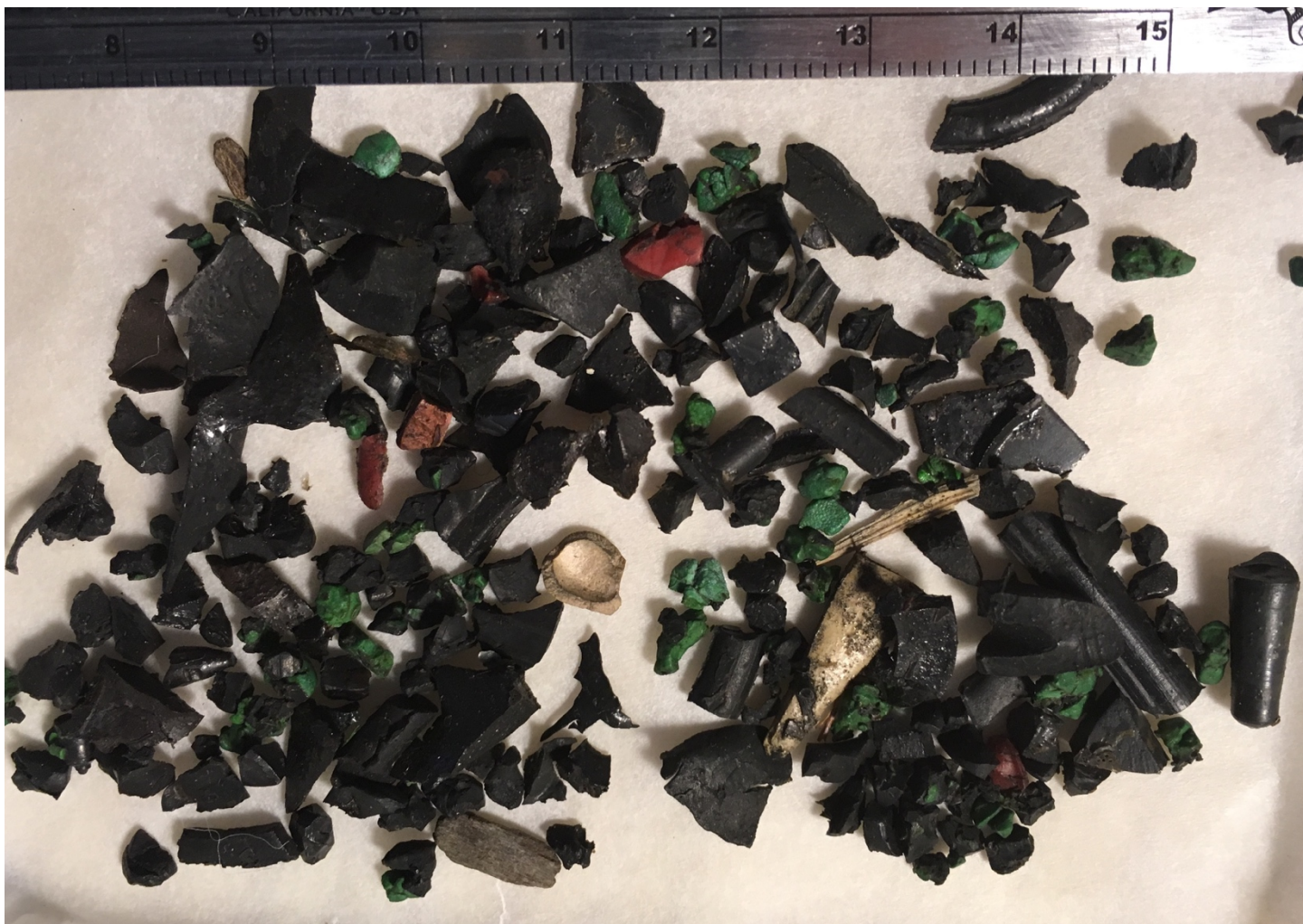
- Shred sample 1: ICP-MS - 7,079 ppm lead; HD XRF – 59,096 ppm lead
- Shred sample 2: ICP-MS – 6,514 ppm lead; HD XRF – 3,612 ppm lead

Third party lab testing verified lead levels of 6,514 and 7,709 in two shred samples.

## Conclusion

The collected rubber shred was found to be highly heterogeneous, containing a wide range of lead levels. Both ICP-MS and HD XRF provide useful data about the lead content of the shred. According to HD XRF, which sampled small spots of individual shreds, 24% of the bulk sample contained shred with high levels (greater than 1,951 ppm) of lead. ICP-MS analysis of these samples confirmed that some shred contained up to 7,000 ppm lead. These results illustrate the difficulty of assuring a clean supply of a recycled shred material. We recommend further investigation of this playground and similar playgrounds, and the exploration of non-rubber alternative materials.

If you have any questions about this testing please contact Jeff Gearhart at 734-369-9276 or [jeffg@ecocenter.org](mailto:jeffg@ecocenter.org).



*Rubber shred material from poured in place (PIP) playground  
at Janney Elementary School, (measurement units centimeters)*

## TEST REPORT

Date of Report: 4/16/2019

Project ID / Job Number: 234106664

Client: **Ecology Center**

Address: **339 E. Liberty Suite 300  
Ann Arbor, MI 48107 USA**

Model Identification: **14972 & 14973**

Item Description: Tire Crumb Sample

Number of Samples Submitted: 2

Additional Information: None

Test Parameters: **Total Lead Content in Substrates**

Date Received: 4/3/2019

Testing Period: 4/3/2019 – 4/16/2019

Delivery Condition: *Apparent Good*

Testing Location: TÜV Rheinland of North America  
2709 SE Otis Corley Dr, Suite 11  
Bentonville, AR 72712 USA

Other Aspects: N/A

Test Report Compiled by:



Cody Carson / Senior Chemist

Test Report Reviewed by:



Madison Johnson / Laboratory Supervisor

*Test result is drawn according to the kind and extent of tests performed. This test report is not permitted to be duplicated in extracts without permission of the test facility. This test report does not entitle any safety mark on this or similar products.*

**Test Parameters:**

Test Specification
1. Total Lead Content in Substrates

**Test Results:**

**Material Breakdown List - Chemical Testing**

Material No.	Material	Color	Component / Location
1	Rubber	Black	14972
2	Rubber	Black	14973

**RESULTS**

**1. TOTAL LEAD CONTENT IN SUBSTRATES:**

**Test Method:** The sample was digested with acid using microwave digestion techniques. Lead content was analyzed by Inductively Coupled Plasma – Mass Spectrometer according to CPSC-CH-E1002-08.3

Test No.	Material or Component	Lead Content (mg/kg)
		MDL: 5 mg/kg
1	1	7079 mg/kg
2	2	6514 mg/kg

Abbreviation: MDL = Method Detection Limit mg/kg denotes milligram per kilogram (ppm)

**Sample Photos:**



Test Article(s)

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